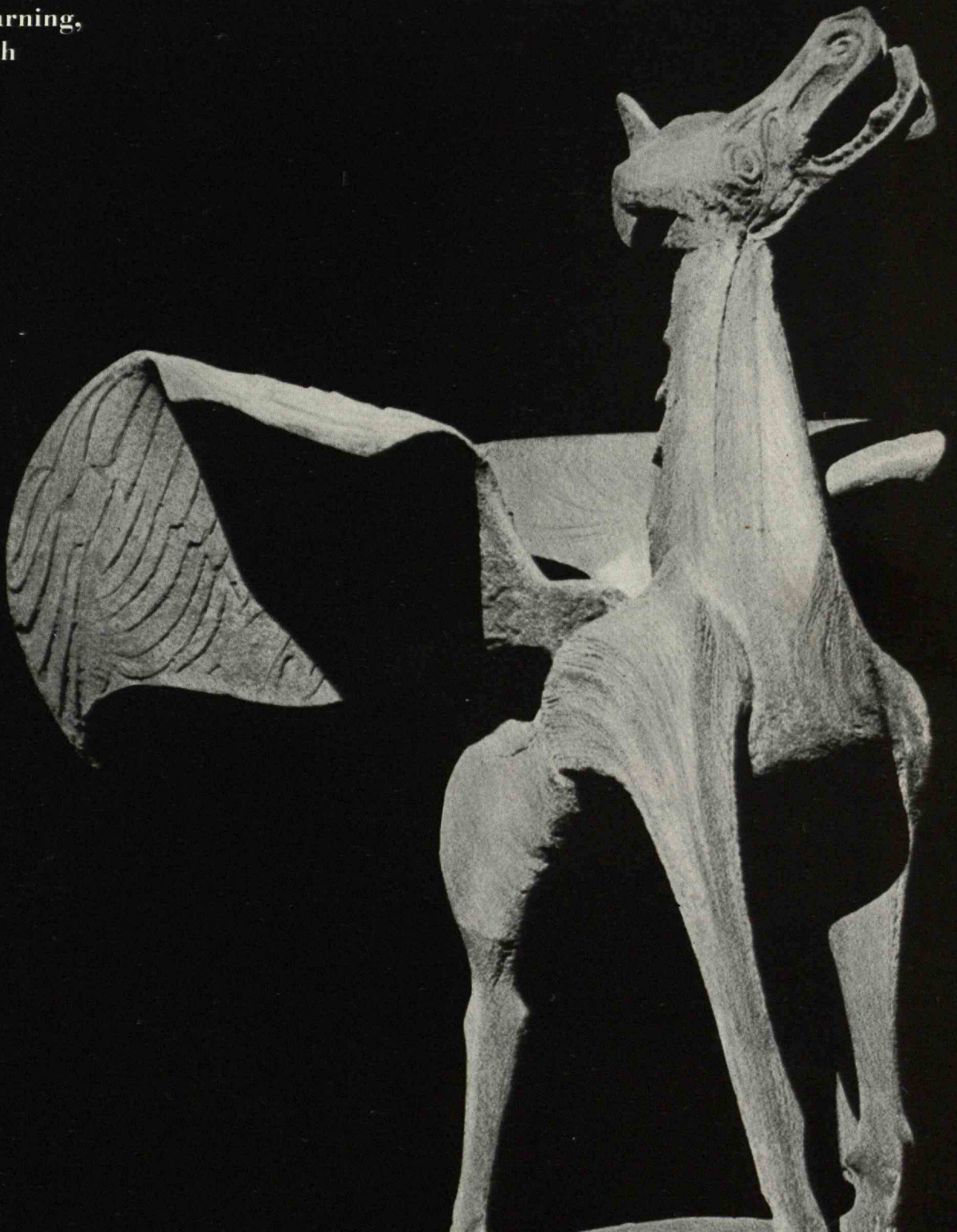


# Technology Review

In this Issue:  
The Higher Learning,  
by Huston Smith



MARCH, 1960

# technology review

Published by MIT

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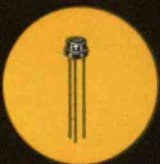
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By William W. Seifert, Massachusetts Institute of Technology; and Carl W. Steeg, Jr., Radio Corporation of America. *McGraw-Hill Electrical and Electronic Engineering Series*. 955 pages, \$15.00

A presentation of the mathematical tools of basic importance in the field of Systems Engineering. It should be of wide interest to control engineers concerned with systems studies, and as a text for graduate courses in this area. This book presents a broad coverage of advanced theoretical techniques in a unified fashion, and from the point of view of the control-systems engineer.

## SERVOMECHANISM PRACTICE, New Second Edition

By William R. Ahrendt, University of Maryland; and C. J. Savant, Jr., American Electronics, Inc. *McGraw-Hill Electrical and Electronic Engineering Series*. 566 pages, \$12.50

This book covers all the important servo components and includes many additional items which have come into wider use since the first edition. It explains in detail the practical aspects of servomechanisms, describes the many ways in which the essential functions of servomechanism components can be accomplished, discusses the problems associated with the operation of servos and their components, and outlines practical design and manufacturing techniques to obtain optimum performance.

## THEORY OF PLATES AND SHELLS, Second Edition

By S. Timoshenko; and S. Woinowsky-Krieger, Laval University. *Engineering Societies Monographs*. 580 pages, \$15.00

This second edition has been revised extensively, and the principal additions include: (1) an article on deflection of plates due to transverse shear, (2) an article on stress concentrations around a circular hole in a bent plate, (3) a chapter on bending of plates resting on an elastic foundation, (4) a chapter on bending of anisotropic plates, and (5) a chapter reviewing certain special and approximate methods used in plate analysis.

## REACTION KINETICS FOR CHEMICAL ENGINEERS

By Stanley M. Walas, University of Kansas. *McGraw-Hill Series in Chemical Engineering*. 338 pages, \$9.50

A text on applied kinetics for use at the senior or first year graduate level. It covers the subject from the standpoint of the process designer, not from that of the physical chemist. Its aim is to present as concisely and clearly as possible enough material to enable the reader to analyze kinetic data, interpret recent literature, and accomplish the process design of chemical reactors with some facility.

## PRINCIPLES OF MODERN PHYSICS

By Robert B. Leighton, California Institute of Technology. *McGraw-Hill International Series in Pure and Applied Physics*. 795 pages, \$12.50

Expository and analytical, rather than historical and discursive, this book concentrates first on broad fundamental principles which underlie physics as we know it, and then shows how these principles operate to yield the observed complex behavior of matter. The author treats special relativity from the four-vector point of view, and deals with quantum mechanics by starting with fundamental postulates whose connections with experimental facts are pointed out as they are introduced.

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## Feedback

### Pupil's Re-creation Or Teacher's Recreation

FROM PHILIP FRANKLIN:

In the last few years, there has developed widespread awareness of the importance of an early study of mathematics in the training of engineers and physical scientists. This has caused several groups to re-evaluate the high school curriculum in mathematics, and to implement many of their ideas through institutes for teachers such as those of the National Science Foundation. An effort of this kind at the Junior High School or even the primary grades level, the Madison Project, was described by Professor Robert B. Davis in a recent article in *The Technology Review* (Dec., 1959, pp. 28-30).

The objective of these efforts is laudable—to improve and modernize the teaching of the traditional high school mathematics subjects. But some of the apparently demonstrated conclusions about learning mathematics can easily be carried too far, and it is this caution that the writer would like to emphasize.

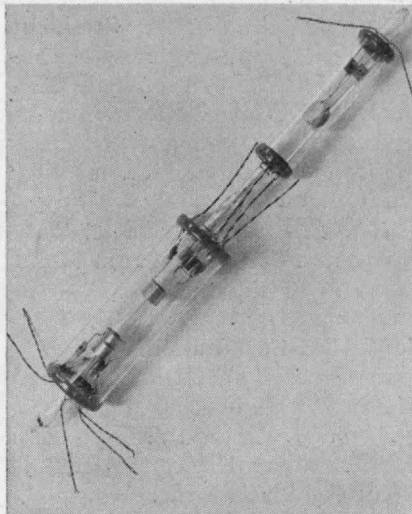
That the small number of "low-I.Q." students per teacher helped maintain interest was to be expected. And that, when the teachers felt the zeal of a new "educational experiment," they imparted interest to the students is quite believable. However, this last effect is hard to sustain over a period of years.

But that changes in language and notation had much virtue seems doubtful. An example was the use of the relatively vague words "general mathematics" and "condition" for the much more precise terms "algebra" and "equation." And compare the Project's formulation:

If  $3 + \square = 5$ , what goes in the box?  
with the traditional formulation:

Solve  $3 + x = 5$ .

The "new" notation is costlier to print, but is it new? It is strongly reminiscent of the formulations of Diophantos of Alexandria (c. 350 A.D.). The full appreciation by mathematicians of the notation  $ax + b = c$ , with any of the letters positive or negative, dates from the "Geometry" of Descartes in 1637. Present-day engineering students are still a little incredulous the first time they encounter  
(Continued on page 49)



**THIS VACUUM TUBE** was made from a kit of parts that is now being evaluated in the schools. How it was assembled is described in the article on page 40.

### The Cover

Pegasus posed in the center of the Kresge Auditorium, facing the organ, for *The Review's* cover. The sculpture is described in the article on pages 21 and 22.

EDITOR: Volta Torrey; BUSINESS MANAGER: R. T. Jope,'28; CIRCULATION MANAGER: D. P. Severance,'38; EDITORIAL ASSOCIATES: J. J. Rowlands, Francis E. Wylie, John I. Mattill; EDITORIAL STAFF: Ruth King, Diana de Filippi; BUSINESS STAFF: Madeline R. McCormick, Louise E. Ryan; PUBLISHER: H. E. Lobdell,'17.

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# Individuals Noteworthy

## New Advisory Council

ANOTHER LINK between the business world and M.I.T. was formed this winter when Dean Howard W. Johnson of the School of Industrial Management announced the formation of a new Advisory Council under the chairmanship of Alfred P. Sloan, Jr., '95, Honorary Chairman of the General Motors Corporation and President of the Alfred P. Sloan Foundation which established the school.

"Our council members will serve the school," said Dean Johnson, "by providing advice and counsel on its various study and research programs, and by acting as a sounding board for new ideas."

Council members, who will serve for three years, are:

*Albert Bradley*, Director and Former Chairman of the Board, General Motors Corporation, and Chairman, Alfred P. Sloan Foundation, Inc.

*Russell DeYoung*, '40, President, Goodyear Tire and Rubber Co.

*Bradley Dewey*, '09, Former President, Dewey & Almy Chemical Division, (W. R. Grace & Co.)

*Cecil H. Green*, '23, Honorary Chairman of the Board, Geophysical Service Inc.

*Robert T. Haslam*, '11, Consultant and Director, W. R. Grace & Co.

*Wayne J. Holman, Jr.*, '39, Chairman of the Board, Chicopee Manufacturing Corporation.

*Theodore V. Houser*, Former Chairman of the Board, Sears, Roebuck & Company.

*George M. Humphrey*, Chairman of the Board, National Steel Corporation.

*Devereux C. Josephs*, Chairman of the Board, New York Life Insurance Company.

*Frederick R. Kappel*, President, American Telephone & Telegraph Company.

*Semon E. Knudsen*, '36, General Manager, Pontiac Motor Division, General Motors Corporation.

*George J. Leness*, '26, Chairman of the Executive Committee, Merrill, Lynch, Pierce, Fenner and Smith, Inc.

*William B. Murphy*, President, Campbell Soup Company.

*Alfred C. Neal*, President, Committee for Economic Development.

*Robert C. Sprague*, '23, Chairman and Treasurer, Sprague Electric Company.

*John C. Virden*, Chairman of the Board and President, Eaton Manufacturing Company.

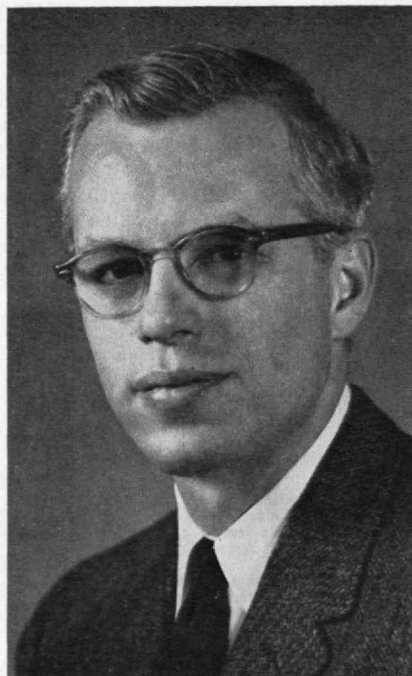
*Thomas J. Watson, Jr.*, President, IBM Corporation.

*James E. Webb*, Director, Kerr-McGee Oil Industries, Inc.

*Arnold J. Zurcher*, Vice-president and Executive Director, Alfred P. Sloan Foundation, Inc.

## To Resume Teaching

ONE of the foremost authorities in the communications-systems field, Wilbur B. Davenport, Jr., '43, will resume teaching next fall as professor of electrical engineering at M.I.T. after nine years on the staff of Lincoln Laboratory.



Wilbur B. Davenport, Jr., '43



**PAUL A. SAMUELSON**, Professor of Economics at M.I.T., was elected First Vice-president of the American Economic Association at its recent meeting in Washington. His textbook on economics is used in many schools.

Dr. Davenport was a teaching assistant in the Department of Electrical Engineering from 1941 to 1943. He then served for three years as a fire-control radar officer in the United States Navy. After more years on the M.I.T. Faculty, he went to Lincoln, where he has served in the Communications and Components Division and, since 1958, as head of the Information Processing Division.

He is a consultant to the Director of Defense Research and Engineering, the National Security Agency and the U.S. Navy Special Projects Office. He was co-author with William L. Root, '43, of *An Introduction to the Theory of Random Signals and Noise* in 1958, and is a fellow of the Institute of Radio Engineers.

"Dr. Davenport is an unusual combination of skillful teacher, keen research man, and bold leader of advanced engineering work," says Jerome B. Wiesner, Acting Head of the Electrical Engineering Department. "He will be able to contribute very substantially to the work on engineering education and on communication sciences that we have planned for the next decade."

(Continued on page 6)

## OUT OF THE LABORATORY



**Forthcoming space exploration** will require exotic fuels and new concepts in energy conversion to keep men alive and equipment operating for long periods of time beyond the earth's atmosphere. Advanced hydrogen systems recently developed by The Garrett Corporation have solved this problem of providing the electrical, hydraulic and pneumatic power, plus cooling and heating required aboard a satellite or space capsule during launching, outer space flight and re-entry... another contribution by Garrett to man's conquest of space.

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### **Individuals Noteworthy**

*(Continued from page 4)*

#### **Warren J. Mead: 1883-1960**

PROFESSOR EMERITUS of Geology Warren Judson Mead died on January 16 at his home in Belmont. Dr. Mead headed the M.I.T. Department of Geology from 1934 until he retired in 1949.

Born in Plymouth, Wis., in 1883, Dr. Mead was graduated from the University of Wisconsin in 1906, where he received his master's in 1908 and his doctorate in 1926. He was a member of the Wisconsin faculty from 1906 until 1934. He wrote numerous geological papers and collaborated with C. K. Leith in producing the volume entitled *Metamorphic Geology* (1915). His nonacademic work included consulting for the Panama Canal Commission, the Corps of Engineers, the Colorado River Board to determine the feasibility of Boulder Dam, the Aluminum Company of America, and the Reynolds Metal Company. He also investigated iron and coal resources of South Manchuria.

Dr. Mead was a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences and the Geological Society of America.

He is survived by his wife, Bertha Taylor Mead, and three sons, Warren, of Waterloo, Iowa; Judson, of Bloomington, Ind.; and Jeremiah, of Waban, Mass.

#### **Gerald Putnam: 1902-1960**

IN JANUARY Gerald Putnam, '23, Assistant Professor of Engineering Graphics in the Department of Mechanical Engineering, died in a Cambridge hospital.

Professor Putnam was born on November 27, 1902, in Clinton, Mass. He worked with water power engineering companies in Albany before joining the Institute Faculty in 1933, and held positions in the Departments of Civil Engineering, Drawing and Graphics before joining the Mechanical Engineering Department. He also served as lecturer in mathematics at Tufts University and Northeastern University.

He is survived by his wife, Dorothy Valentine Putnam.

*(Continued on page 12)*



... a hand in things to come

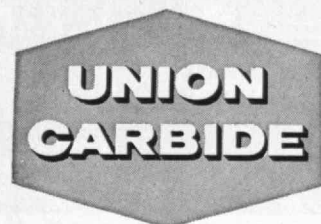
## Shaping another sun

7000 degrees . . . an inferno approaching that of the sun's surface has been created by the scientists of Union Carbide. The energy comes from the intensely hot carbon arc. Through the use of mirrors, the heat is reflected to form a single burning image of the electric arc at a convenient point. Called the arc-image furnace, it extends the limits of high-temperature research on new materials for the space age.

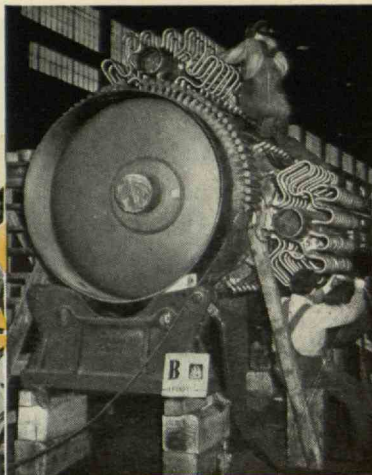
For years, mammoth carbon and graphite electrodes have fired blazing electric furnaces to capture many of today's metals from their ores and to produce the finest steels. But, in addition to extreme heat, the carbon arc produces a dazzling light that rivals the sun. In motion picture projectors, its brilliant beam floods panoramic movie screens with every vivid detail from a film no larger than a postage stamp.

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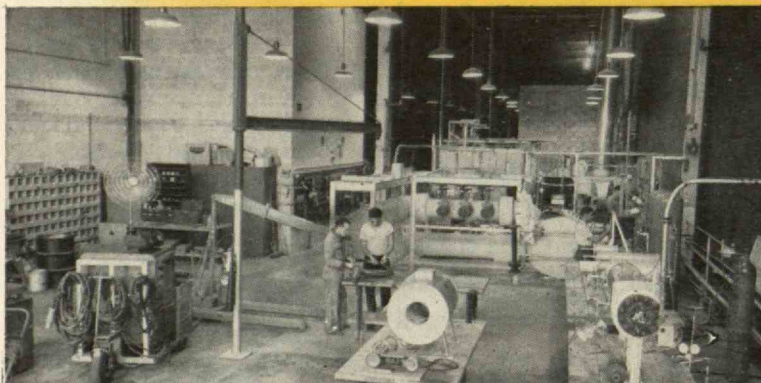
(Left) The huge riverside crane at Combustion's Chattanooga Division easily lifts this 92-ton stainless steel reactor vessel — the most complex reactor vessel built to date — into a barge for shipment to the Enrico Fermi Power Station, Lagoona Beach, Michigan.

(Right) Stainless steel sodium heat exchanger consisting of a series of tubes within tubes, encased in a pressure vessel.

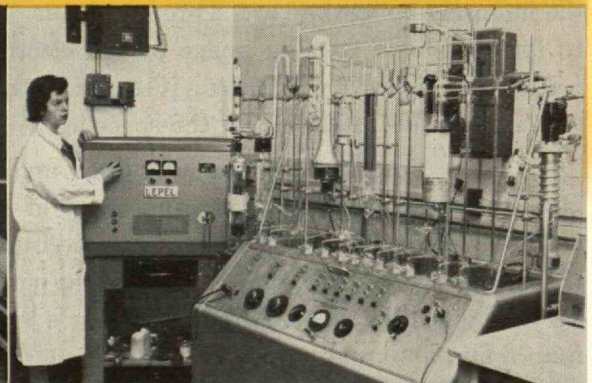
## What C-E is doing to advance

The strange and wondrous world of the atom has been examined and surveyed by C-E scientists and engineers since 1946. The object—to put the controlled energy of the atom to productive use for the generation of power. The result—a wealth of knowledge and experience in the application, design and manufacture of nuclear power equipment. Backed by specially designed laboratories and manufacturing facilities, this knowledge and experience—greatly augmented and enriched by the acquisition of the General Nuclear Engineering Corporation early last year—has enabled C-E to undertake many kinds of nuclear work.

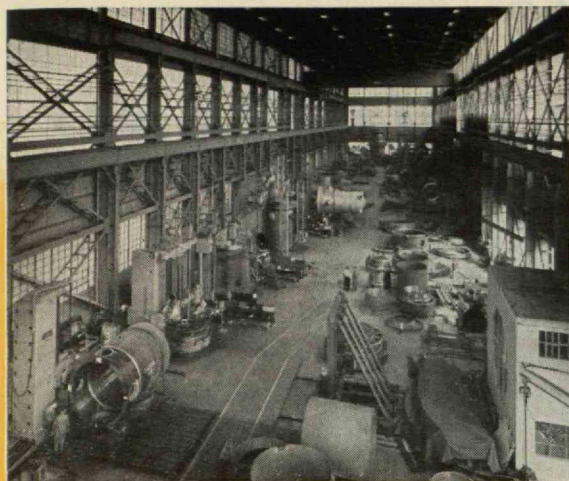
Notable C-E and General Nuclear projects are outlined on the opposite page. Virtually all of them are *current*, and many have a significant relationship to the vital task of making nuclear power competitive with conventional power. Collectively, these projects will contribute importantly to the Company's objective of achieving the same position of leadership in the atomic world of tomorrow which it has long since achieved in present-day methods of power generation.



Partial view of laboratory of General Nuclear Engineering Corporation at Dunedin, Florida, showing equipment used for the study of a high-pressure, high-temperature gas coolant system.



Portion of a laboratory at C-E's Nuclear Division, Windsor, Connecticut, showing gas analysis equipment used for detecting the presence of small quantities of gases in reactor materials.



The 520-foot-long Heavy Vessel Bay at C-E's Chattanooga Division was created especially for the manufacture of heavy nuclear components.



Portion of the 530-acre site occupied by C-E's Nuclear Division at Windsor, Connecticut. This Division is equipped for the development, design and test of reactor systems and the manufacture of reactor cores and core components.

# Nuclear Power Progress

## C-E NUCLEAR PROJECTS

### For Electric Power Stations

- In association with Stone & Webster Engineering Corporation, a design study for AEC of an advanced type of large (236,000 kw) pressurized water reactor power plant.
- A long-term development program for AEC to determine the best means of using nuclear energy to generate superheated steam. (Success in this endeavor will be a big step forward in reducing the cost of nuclear-generated power.)
- Design studies for the Puerto Rico Water Resources Authority, under AEC contract, to determine the best means of adding nuclear superheat to a boiling water reactor.
- Design, research and development work covering a gas-cooled, heavy-water-moderated, pressure-tube type reactor for the East Central Nuclear Group, Inc., and the Florida West Coast Nuclear Group. This development will also lead to a nuclear power plant using superheated steam.
- The development and test of various kinds of fuel elements and fabricating procedures, under contract with the AEC.
- The design and manufacture of reactor vessels, including the largest and most complex vessels of their type built to date, for the Shippingport Station (America's first full-scale atomic power plant), the Enrico Fermi Atomic Power Plant, the Humboldt Bay Nuclear Power Station, and Italy's first nuclear power plant.

### For Military Power Plants

- Design study for U. S. Army, under AEC contract, of a truly package type of nuclear reactor, using the boiling water con-

cept, for remote installations. This program includes operation of a prototype boiling water reactor at the National Reactor Testing Station in Arco, Idaho, and the training of military technicians in the operation of the installation.

- The conceptual design and operation of a nuclear test reactor, under AEC contract, to permit full-scale testing of prototype reactor cores for military field plants.

### For Naval Power Plants

- The design and manufacture of a submarine reactor system designed to set new standards of accessibility, speed of startup and operational flexibility—and the operation of a land-based prototype installation.
- The design and manufacture of numerous reactor cores, reactor vessels, steam generators and pressurizers for various types of submarines and naval surface ships.

### For Merchant Ship Propulsion

- The design and engineering study of a prototype pressurized water reactor for a 45,000-ton tanker, under contract with the AEC and the U. S. Maritime Commission.

### Special Studies and Services

- Irradiation studies, fabrication studies, evaluation studies of the general properties of materials, quality control, isotopic analyses, strain gauge and photoelastic testing, basic and applied research in ferrous metallurgy.
- Bio-assays, decontamination, environmental monitoring, radiochemical analyses and radiological safety programs.

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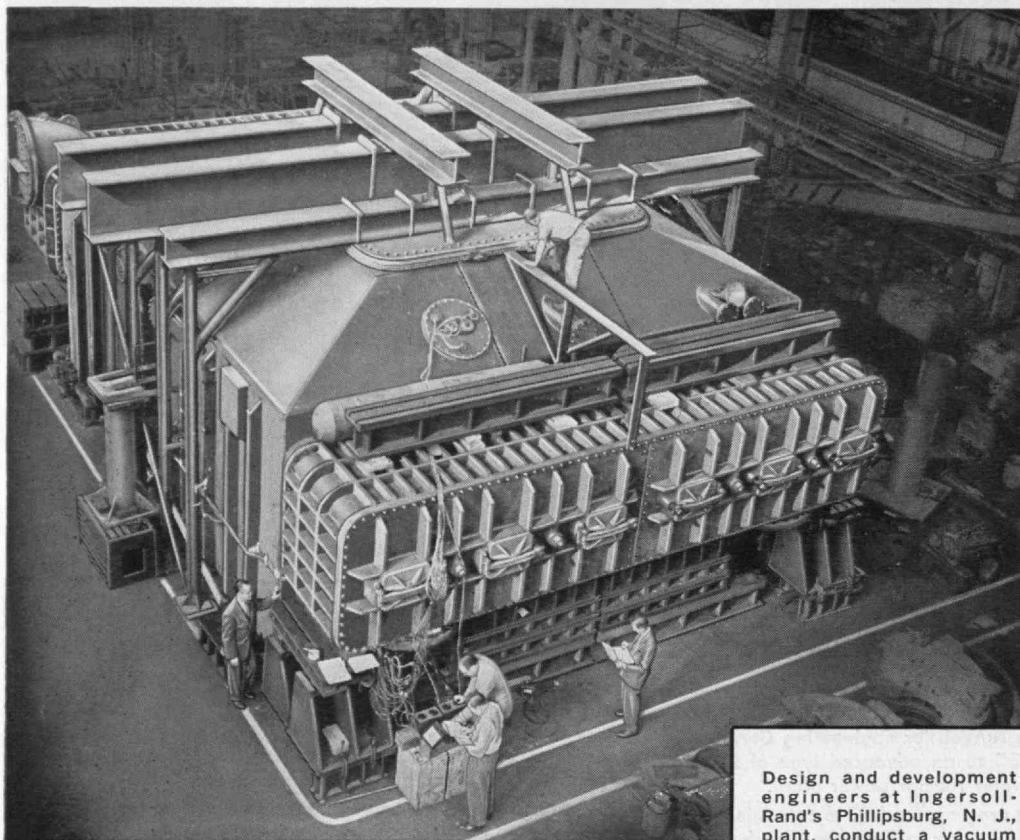


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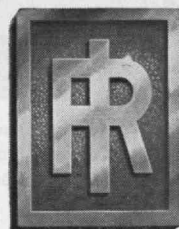
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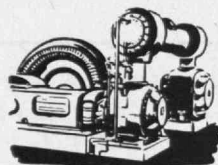
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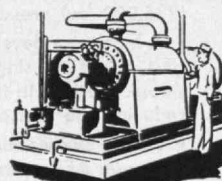
Among the many graduates of Massachusetts Institute of Technology at Ingersoll-Rand are:  
L. C. Hopton, 1926, President; J. Bentley, 1925, Vice-President.



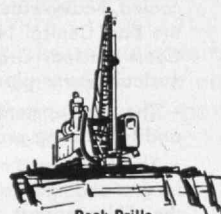
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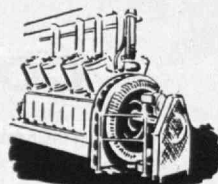
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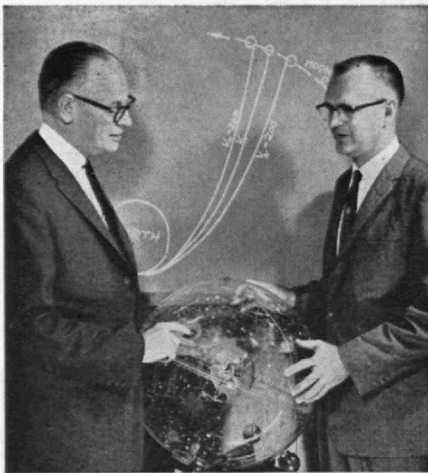
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Arthur E. Raymond, Senior Engineering Vice President of Douglas, goes over a proposed lunar trajectory with Maxwell Hunter, Asst. Chief Engineer—Space Systems

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The new NASA Thor-boosted research rocket, DELTA, now in production at Douglas, will set up important signposts for further space explorations.

Combining elements already proved in space projects with an advanced radio-inertial guidance system developed by the Bell Telephone Laboratories of Western Electric Company, DELTA has the versatility and accuracy for a wide variety of satellite, lunar and solar missions. Douglas reliability rides with these 90 foot, three-stage rockets on every flight.

Douglas is now seeking qualified engineers, physicists, chemists and mathematicians for programs like ZEUS, DELTA, ALBM, GENIE, ANIP and others far into the future. For full information write to Mr. C. C. LaVene, Douglas Aircraft Company, Inc., Santa Monica, California, Section N.



MISSILE AND SPACE SYSTEMS ■ MILITARY AIRCRAFT  
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AIRCOMB ■ GROUND SUPPORT EQUIPMENT

## Individuals Noteworthy

(Continued from page 6)

### Burdell to Ankara

RETIRING after 22 years' service as the chief administrative officer of The Cooper Union, Edwin S. Burdell, '20, this month assumes the presidency of the Middle East Technical University in Turkey.

Dr. Burdell became a member of the M.I.T. Faculty upon his appointment as Associate Professor of Sociology in 1934. He was named as the first Dean of Humanities in May, 1937, at which time President Karl T. Compton said the creation of the deanship was "another significant step in the efforts of this institution to meet the challenge of a changing social order in America." In 1938, Dr. Burdell resigned as Dean to become Director of The Cooper Union, which title became that of President in 1951.

The Middle East Technical University at Ankara was organized by the United Nations Educational, Scientific, and Cultural Organization in 1958. It now has 600 students, and an eventual enrollment of 20,000 is planned. The university has faculties in architecture, engineering, administration, agriculture, and education.

(Continued on page 46)



Machlett Laboratories, Inc.

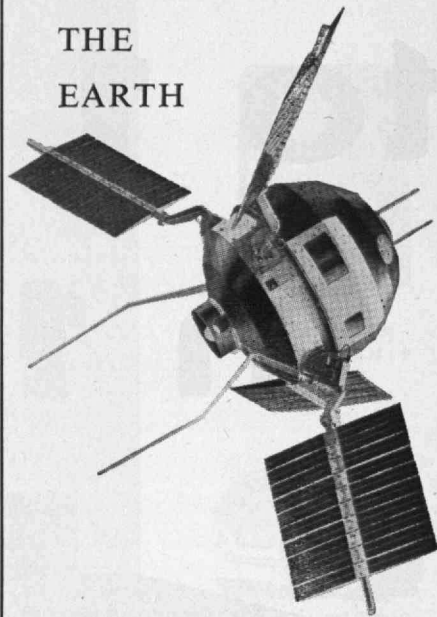
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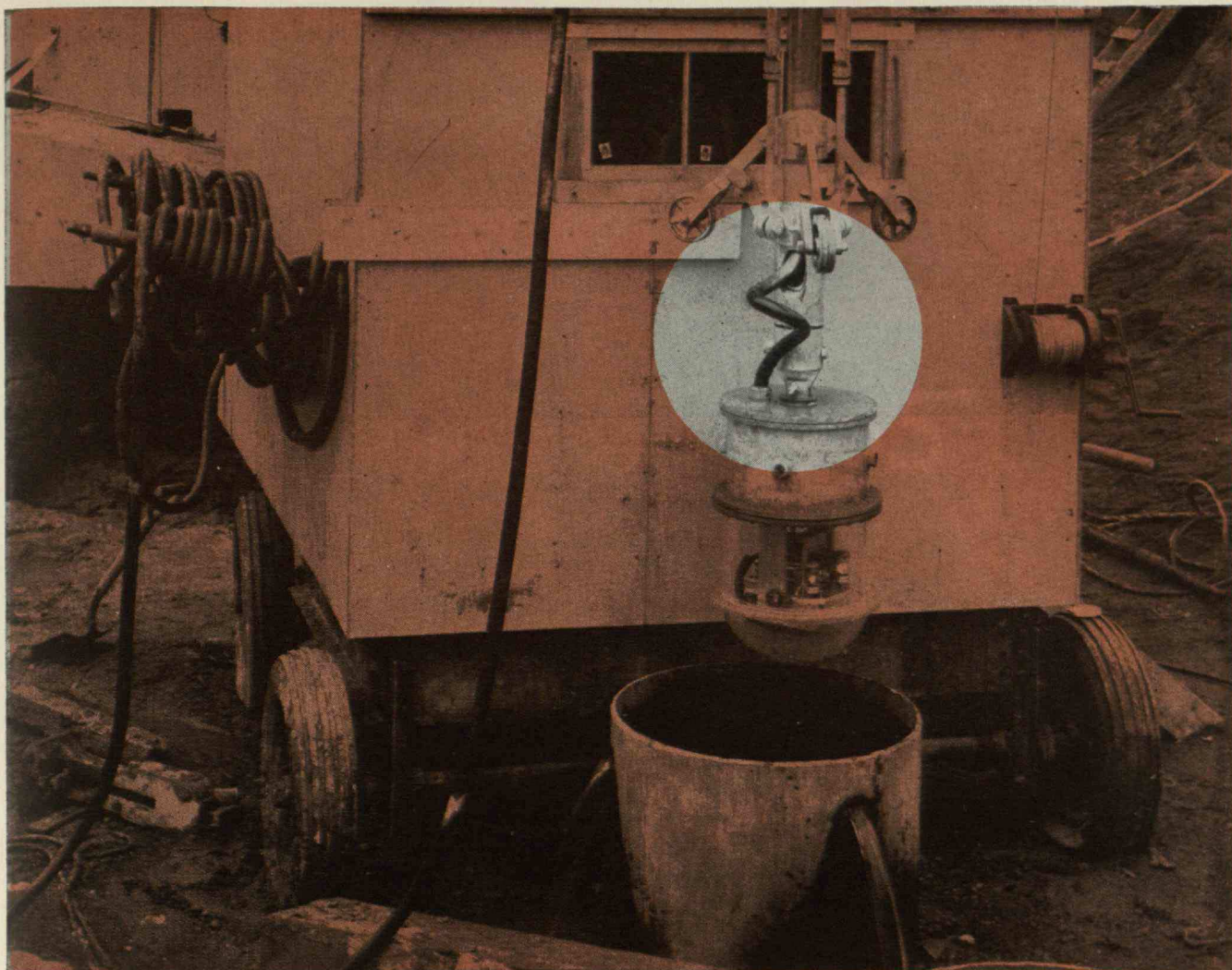
Space Technology Laboratories carried out the Able III program which put Explorer VI in space... one of a series of advanced scientific experiments conducted by STL in conjunction with the Air Force on behalf of NASA.

STL's leadership in military applications of space technology is illustrated by its successful accomplishments as the contractor responsible for over-all systems engineering and technical direction of the Atlas, Titan, Thor, and Minuteman programs.

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## OPTIC NERVE FOR EYES THAT SEE 100 FEET BELOW THE SURFACE

This is a television camera. Its job is to photograph the substrata of excavations, thereby providing information needed by engineers in planning the construction of Boston's new Prudential Center, a modern, multi-million dollar real estate development.

Here in the Back Bay section of Boston, with its artificially maintained water table, this sealed camera must go down into a water-filled hole 100 feet below the surface. To transmit the picture from the camera to the surface monitor, Lake Service Corp. of Brighton, Massachusetts, designers and manufacturers of the television equipment, chose Simplex Anhydrex XX insulated cable because of its ability to withstand the rigors of submarine and direct burial duty.

For all types of service involving high and low voltages, whether aerial, underground or submarine, or for everyday plant wiring, it pays to call a Simplex Engineer.

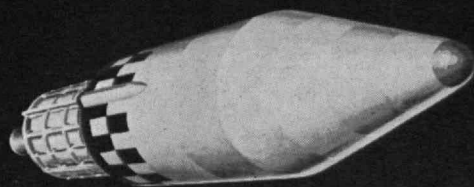
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These programs include: celestial mechanics; computer research and development; electromagnetic wave propagation and radiation; electronics; the flight sciences; human engineering; magnetohydrodynamics; man in space; materials and processes; applied mathematics; operations research and analysis; ionic, nuclear and plasma propulsion and exotic fuels; sonics; space communications; space medicine; space navigation; and space physics.

Headquarters for the Division are at Sunnyvale, California, on the San Francisco Peninsula, and research and development facilities are in the Stanford Industrial Park in Palo Alto and at Van Nuys in the San Fernando Valley.

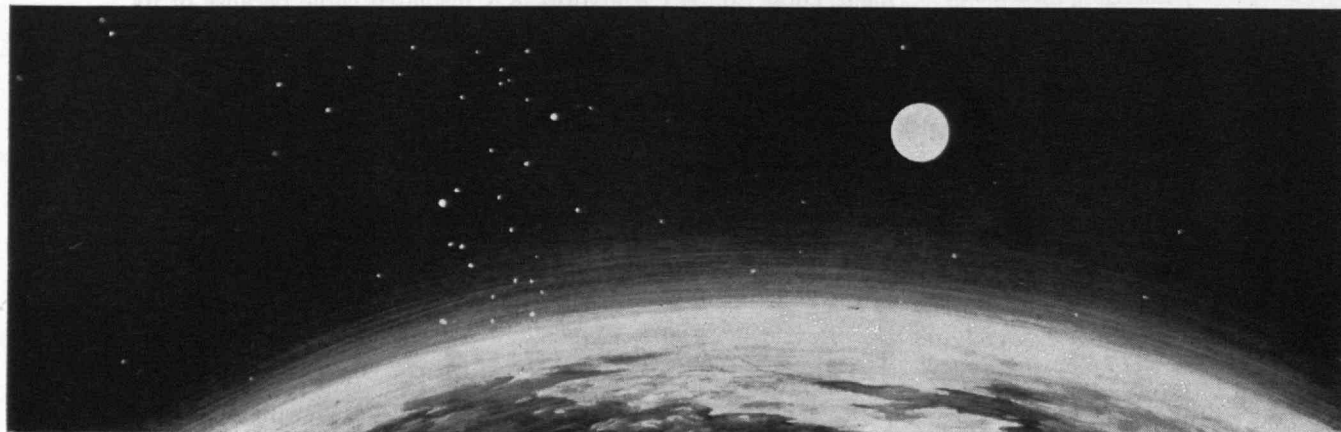
Facilities are new and modern and include the latest in technical equipment. A 4,000 acre Division-owned static test base in the Ben Lomond mountains near Santa Cruz provides for all phases of static field test. In addition, flight test facilities are provided at Cape Canaveral, Florida, and Vandenberg AFB, Santa Maria, California.

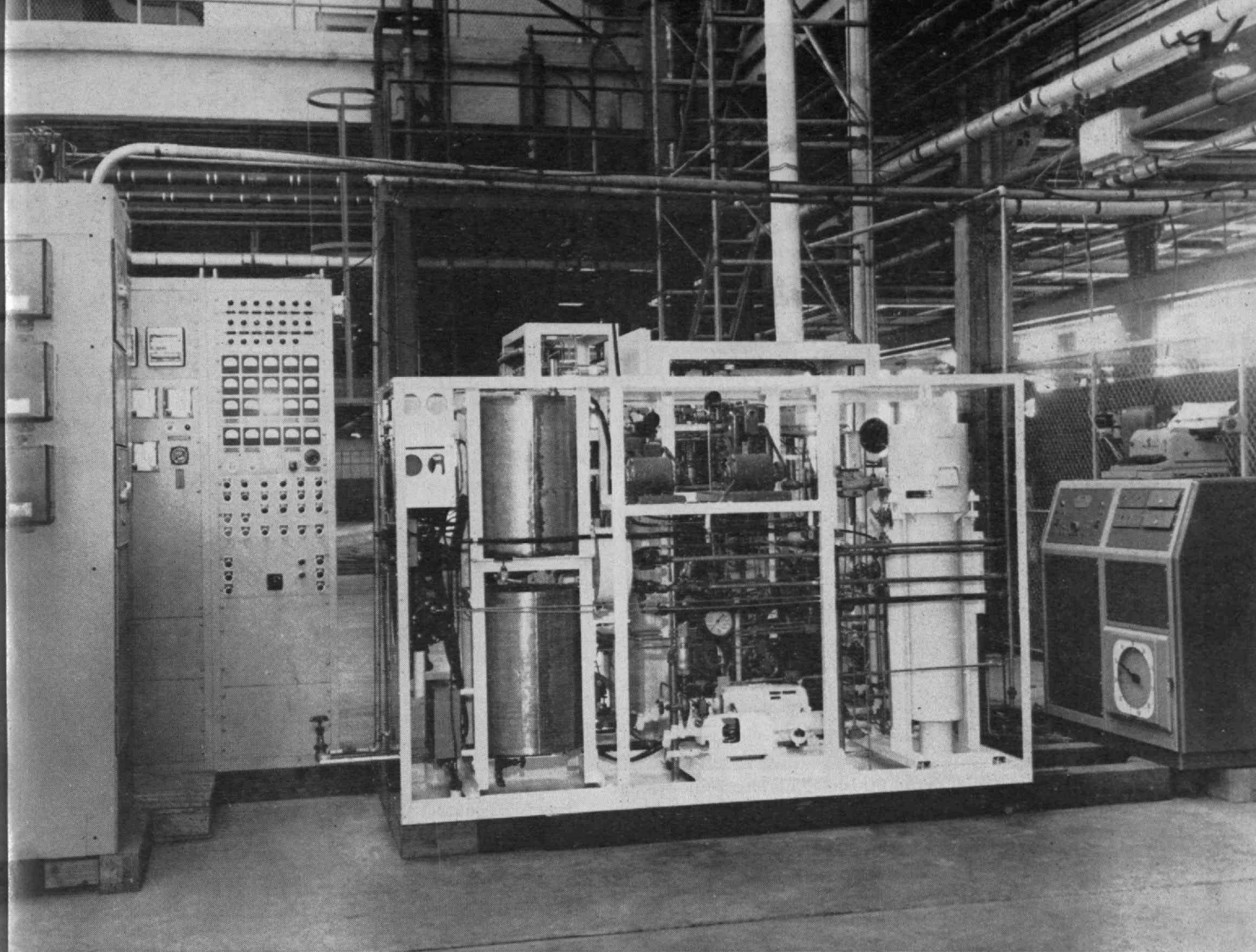
### ENGINEERS AND SCIENTISTS

Such programs reach into the future and deal with unknown and stimulating environments. It is a rewarding future with a company that has an outstanding record of progress and achievement. If you are experienced in any of the above areas, or in related work, we invite your inquiry. Please write: Research and Development Staff, Dept. C-52FF, 962 W. El Camino Real, Sunnyvale, California. U.S. citizenship or existing Department of Defense clearance required.

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General view of components. Extreme right is data logger recording thirty-two points of flow, temperature and pressure. Asbestos covered line in rear is the In-pile line. The farthest section is that which will be inserted in reactor. Unit in center contains make-up pump, vacuum pumps and neutron detector. All units are in respective positions as they will be placed on the balcony of reactor.

## TEST LOOP FOR NUCLEAR REACTOR FABRICATED AT LUMMUS' ENGINEERING DEVELOPMENT CENTER

The Lummus Company Engineering Development Center, Newark, N.J., recently completed the fabrication, assembly, test operation, and dismantling of a  $\frac{3}{4}$ " In-pile Test Loop designed and constructed for Westinghouse Electric Corporation, Atomic Power Department, as a part of the AEC Research and Development Contract AT-(30-3)-222. This loop was built for experiments in connection with irradiation of fuel element and control rod designs for the nuclear power reactor to be installed by the Yankee Atomic Electric Company at Rowe, Massachusetts. The reactor is being designed by Westinghouse for Yankee. Upon delivery to the Materials Testing Reactor at Idaho Falls,

the loop will be installed and operated to simulate actual reactor conditions on fuel element and control rod samples.

The purpose of this experiment is to study the performance of the fuel element design and its resistance to corrosion under irradiation in plant environment. It is also intended to investigate the suitability of the control rod materials. In addition to this, during the first months of operation, a water chemistry stability study is planned.

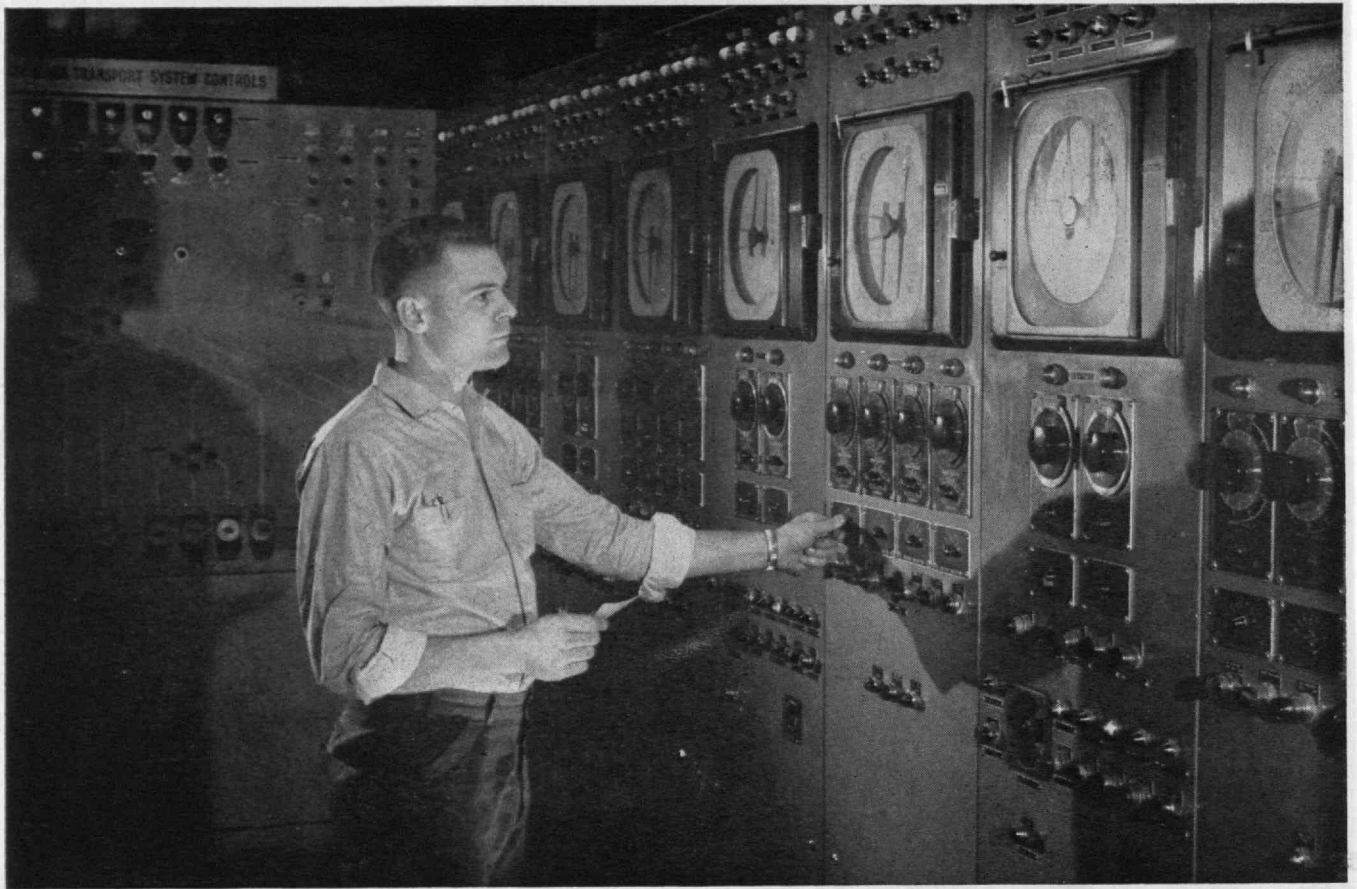
Owing to the limited space available at the Materials Testing Reactor, the entire loop was constructed in two cubicles, an instrument panel, and a motor control center. All of the com-

ponents other than controls were contained in these two cubicles. Careful planning was required to insure that all equipment would fit and that there would be no piping interferences. After assembly, the loop was operated at The Lummus Company Engineering Development Center to insure meeting of engineering specifications and reliability of components. After this operation and acceptance by the customer, the cubicles, motor control centers, and instruments were individually packed and shipped to Idaho Falls for reassembly by Phillips Petroleum Company personnel, who operate the Materials Testing Reactor.



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Now electronic quality control—a new way of precision-building a tire—has been added to the superior materials Goodyear puts *into* a tire. What it means is this:

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2. New whisper-quiet, cushion-soft ride. New chemicals permit us to soften

the tread of our tires *without sacrificing mileage*. Because we have rubber that's softer, yet tougher, Goodyear tires now give you up to 25% more mileage than before.

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Without question, these Goodyear tires are the finest we've ever produced. Goodyear, Akron 16, Ohio.

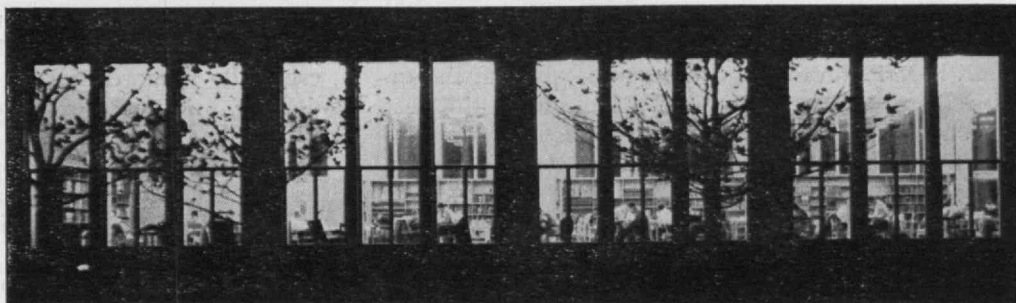
# GOODYEAR

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# Trend Of Affairs



## Fascinating Events In Solid Materials

A NEW Laboratory of Chemical and Solid State Physics has been created at M.I.T. It is directed by John C. Slater, Institute Professor, and the Departments of Physics, Chemistry, Metallurgy, and Mechanical Engineering are represented on its staff of more than 100 researchers and advanced students.

The modern concept of materials and materials research led to the formation of this laboratory. In it the basic knowledge will be sought which is needed to create advanced working substances. Both atomic age and space age requirements have increased the demands for such knowledge. Both plastics and transistors are examples of the products of materials research.

"Effective research in this field," says Professor Slater, "is of the utmost importance to the scientific and technological progress of our country."

Already the National Science Foundation has granted \$599,200 to M.I.T. for studies to be undertaken in this field. Of this sum, \$399,800 was for low-temperature and related studies, and \$199,400 was for research in neutron physics.

The changes that take place at low temperatures in ferromagnetic, ferroelectric, and organic materials have become increasingly interesting to both scientists and engineers. The built-in magnetic properties of individual atoms in ferromagnetic materials, and the spontaneous electrical properties of ferroelectric materials, are being employed in computer components now and further applications seem likely. The new branch of science called cryogenics is based on the discovery that certain metals become superconductors of electricity at very low temperatures.

At times the atoms in the lattice of a crystal of solid material, like guests in the rooms of a hotel, rearrange themselves or exhibit new patterns of activity. These and other phenomena will be studied with an array of such techniques as x-ray diffraction, neutron diffraction, and nuclear magnetic resonance measurements.

For work in neutron physics, the Institute's new reactor and associated apparatus, including a polarized beam neutron spectrometer, will be used. Support for this phase of work previously was provided by the Office of Scientific Research of the Air Force.

## Chu's Law of Student Aid

M.I.T. HAS loaned more than \$5,000,000 at a nominal, noncommercial rate of interest to students to help them pay their tuition. The Institute was the first school to provide this kind of student aid on a large scale, and for 30 years has been able to say proudly that no worthy student was deprived of the educational opportunities it offered because of inability to pay tuition.

Thanks to the rate at which loans have been repaid, additional gifts, and the income from investments, the Technology Loan Fund has grown. But tuition has risen, too. In 1948, it was only \$800 per annum. Next fall, it will be \$1,500. Both the number of loans and the amounts loaned have been rising, and the withdrawals from the fund exceeded its income last year.

Lan J. Chu, '35, Professor of Electrical Engineering, plotted the figures for the last decade when he became chairman of the Committee on Student Aid this year, to see if he could find an empirical "law" relating these loans to tuition—and found that the annual need was proportional to the square of the tuition.

If Chu's hypothesis is used to predict loans in 1960–1961, one finds that they will total \$910,000, and that if tuition is raised again, to, say, \$1,700, in 1962, the annual loans will rise to \$1,170,000. Last year they totaled only \$682,000.

"The Technology Loan Fund," says the report of Professor Chu's committee, "has been well administered, has fulfilled its purpose in the past, and its assets now, including investments and loans outstanding, amount to about \$3,268,600. If its capital is exhausted by further withdrawals for loans, it will become a truly revolving fund. The sum loaned each year, however, will be limited by its income . . .

"It is painful to think that the Institute ever will turn away a worthy student because of his inability to pay its tuition. It is inconceivable, in view of the increasing importance of M.I.T.'s educational services, and the plans for continuous improvement of its facilities and the environment that it provides for students, that the Technology Loan Fund will not be kept adequate to fulfill its noble objective in the future as it has for 30 years. The Committee strongly recommends, therefore, that steps now be taken to obtain annual replenishments to prevent exhaustion of the Technology Loan Fund."

## Special Summer Programs

THE ROSTER of short courses to be given at the Institute during the coming summer looks like a tip sheet on some of the hot subjects in architecture, engineering, management, and science. This year's series includes 26 Special Summer Programs, to be given by Departments in all five Schools. Most will last for two weeks; the first one begins on June 14, and the last ends on September 2.

Between these dates, about 1,650 visitors from industry, government, and other schools will have registered for one or more of these intensive courses. Experience suggests that they will have come from nearly all of the 50 states and many foreign countries.

This year's programs include:

*Theory and Criticism in Architecture and City Planning.*

*Inertial Guidance — Terrestrial and Interplanetary.*

*Modern Research Methods in Biology and Medicine.*

*Fundamentals of Adhesion.*

*Strength of Plastics and Glass.*

*Dynamics and Control of Chemical Engineering Processes.*

*Infrared Spectroscopy: Technique and Applications.*

*City and Regional Planning.*

*Estuary and Coastline Hydrodynamics.*

*Electronic Flash and High-Speed Photography.*

*Modulation Theory and Systems.*

*Noise Reduction.*

*Radar Astronomy.*

*Switching Circuits.*

*Scientific and Engineering Reports.*

*Industrial Dynamics.*

*Planning Marketing Strategy and Tactics.*

*Fluid Power Control.*

*Industrial Photoelasticity.*

*Modern Developments in Heat Transfer.*

*Strain-Gauge Techniques: Fundamentals and Applications.*

*Engineering Aspects of Solidification of Metals.*

*The Electron Microbeam Probe and Its Application.*

*Applications of Probability Theory to Operations Research.*

For further information, write Professor James M. Austin, Director of the Summer Session, Room 7-103, M.I.T.

## The Alumni Council's Meeting

BRIGADIER GENERAL Benjamin S. Kelsey, '28, USAF (retired), and Walt W. Rostow, Professor of Economic History, spoke at the 342d meeting of the M.I.T. Alumni Council on January 25 in the Faculty Club.

General Kelsey, who is Jerome C. Hunsaker Professor of Aeronautical Engineering this year, was formerly Director of Research and Development at the U.S. Air Force Headquarters. He emphasized the variety of situations which may confront the nation's military forces, and mentioned some of the developments now in progress, such as vertical take-off and landing, that can permit greater flexibility in the deployment of military forces in the future.

Professor Rostow stressed the needs for concern re-

garding the allocation of our national resources and for giving more attention to the country's productivity—especially if more effort is to be put into education, defense, and space exploration. Universities such as M.I.T., he concluded, must pioneer in research activity on broad fronts, in the hope that breakthroughs can be provided in older fields as well as in the new areas.

Edwin D. Ryer, '20, Chairman of the Alumni Fund Board, reported that the 1960 Fund had received \$407,000 from 9,440 contributors, and has every reason to expect that this will be another banner year.

President Edward J. Hanley, '24, presided, and 171 members and guests of the Council attended.

## Fellows From Harvard

THE SOCIETY of Fellows at Harvard has been "an extraordinarily favorable seedbed for the development of distinguished university teachers," President Nathan M. Pusey observed on its 25th anniversary. The young scientists, poets, historians, and linguists chosen for these fellowships are given three years of freedom to use Harvard's resources as they choose — and have contributed both to science and the humanities in a great variety of ways.

Six of this society's 155 former members now teach at M.I.T. They are Albert Bush-Brown, Associate Professor of Architectural History; Noam A. Chomsky, Associate Professor of Modern Languages; Peter Elias, '44, Associate Professor of Electrical Engineering; Charles M. Gray, Assistant Professor of History; Marvin L. Minsky, Assistant Professor of Mathematics, and Paul A. Samuelson, Professor of Economics.

## Progress in Paleoecology

SIGMA XI's lecturer at M.I.T. and other New England schools this year is Heinz A. Lowenstam, Professor of Paleoecology at the California Institute of Technology. In his lecture he points out that skeletal remains of prehistoric animals have been the main biological source of information about the earth's early environment, and cites learning how cold or warm the oceans were before there were thermometers or humans as one of paleoecology's achievements. It is now possible, according to Dr. Lowenstam, to measure temperatures as far back as mid-Paleozoic times, some 350,000,000 years ago, and to "evaluate the history of sea water with greater confidence."

## Note to Small Businesses

A SEARCH for jobs in small business concerns was begun this winter by 20 graduate students in the M.I.T. School of Industrial Management. William P. Mott, 3d, of Orinda, Calif., who is chairman of their informal organization, explained:

"Our objective is to seek out companies which are interested in men of ability. We are specifically interested in companies that possess a personally acquainted, close-working management group, yet are not limited to a maximum dollar volume of sales. . . .

"Any company interested in receiving résumés of our members can write *Business Search* in care of the M.I.T. School of Industrial Management."

## 1960 Ballot

IN ADDITION to its selection of Clarence L. A. Wynd, '27, to become the 67th occupant of the M.I.T. Alumni Association's Presidential chair, the National Nominating Committee has presented six further names to appear on the 1960 ballot, as follows:

For Vice-president, 1960-1962 — Thomas F. Creamer, '40, Vice-president, The First National City Bank, New York.

For members of the Association's Executive Committee, 1960-1962 — Randolph Antonsen, '35, Director of New Products Research, Godfrey L. Cabot, Inc., Cambridge; and John L. Danforth, '40, Vice-president and Director, Mechanical Engineering, High Voltage Engineering Corporation, Cambridge.

For nomination as Alumni Term Members of the Institute Corporation, 1960-1965 —

Bennett Archambault, '32, Chairman of the Board and President, Stewart Warner Corporation, Chicago;

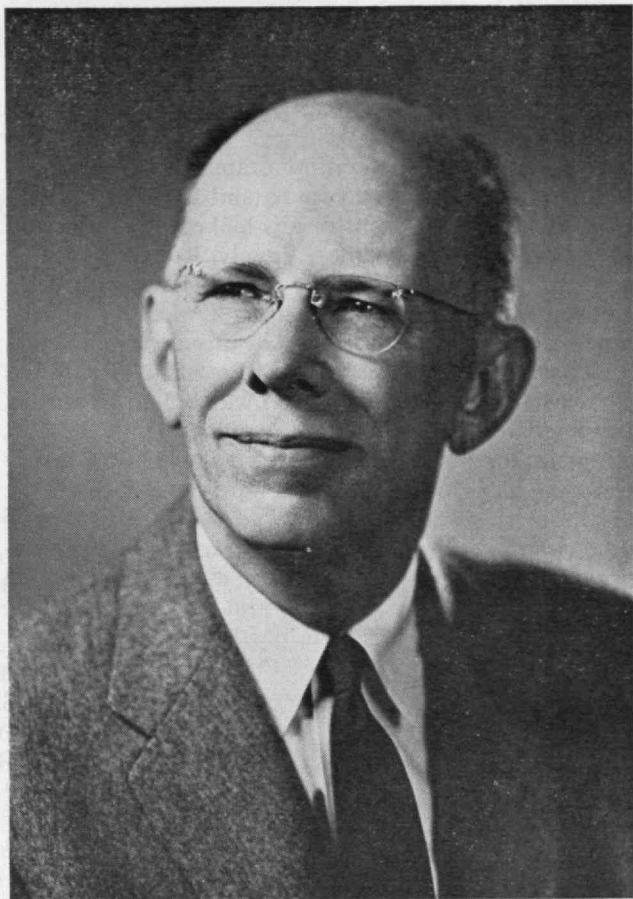
Robert H. Winters, '33, President, The Rio Tinto Mining Company of Canada, Ltd., Toronto; and

Semon E. Knudsen, '36, Vice-president, General Motors Corporation, and General Manager of its Pontiac Motor Division, Pontiac, Mich.

The nominee for President of the Association, Mr. Wynd, is Vice-president of the Eastman Kodak Company in Rochester, N.Y., and General Manager of the Kodak Park Works. He is also Vice-president and Director of the Eastman Gelatine Corporation, and a Director of the Canadian Kodak Company, Ltd., Canadian Kodak Sales, Ltd., and the Ridge Construction Company.

Mr. Wynd is now an Alumni Term Member of the M.I.T. Corporation and the Institute's Honorary Secretary in Rochester. He has been a member of the Visiting Committee on the Department of Chemical Engineering since 1955, and an active member for many years of the M.I.T. Club of Rochester, of which he was President in 1953-1954. Mr. Wynd also has served as a trustee of the Harley School in Rochester and as Chairman of an Advisory Committee for Chemical Engineering at the University of Rochester.

He is a trustee for life of the Rochester Chamber of Commerce and was its president in 1957. He was a consultant to the Office of Production Research and Development of the War Production Board in 1944-1945.

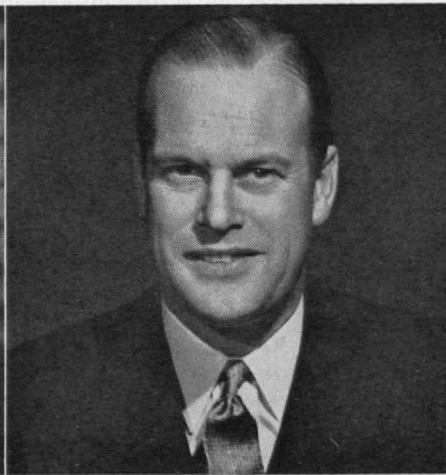
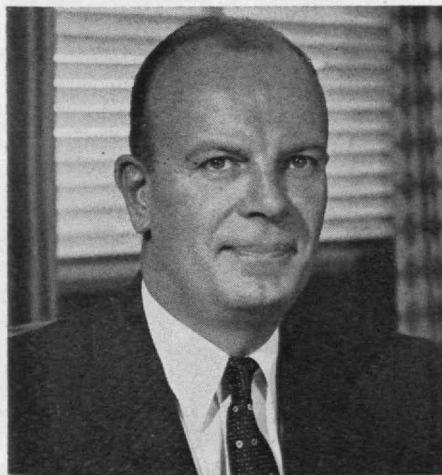


Mr. Wynd is the nominee for President of the Association.

## Radioisotopes Institute

RADIOISOTOPES have come of age, and now they belong in every college science curriculum.

To help put them there, the National Science Foundation and Atomic Energy Commission will sponsor several Summer Institutes in Radioisotopes Technology in June and July, 1960. One of them will be at M.I.T., under the direction of Gordon L. Brownell, '50, Assistant Professor of Nuclear Engineering. About 40 college teachers in the physical sciences and engineering, mostly from New England, will attend these sessions.



Messrs. Archambault, Winters, and Knudsen (left to right) are nominees for Alumni Term Members of the Corporation.

## The Legend of Eli Whitney

MUCH of the credit for introducing interchangeable parts and starting American industry's growth long has been given to Eli Whitney. This was done fulsomely in a recent television drama. But less credit might be accorded to Whitney, and more to some of his contemporaries, if historians looked into the trend of affairs in those days more closely. Robert S. Woodbury, '28, Associate Professor of the History of Technology, suggested at this winter's meeting of the American Association for the Advancement of Science.

"There can be no doubt," said Professor Woodbury, "that what became by the 1850's widely known abroad as the 'American system of manufacturing,' had its origin in the first quarter of the Nineteenth Century and that its principal features were developed in the northeastern section of the United States. This American system included mass manufacture, by power-driven machinery, by machinery especially designed to serve a particular purpose, and by the use of the principle of interchangeable parts.

"The legend says that all this stemmed from Eli Whitney, but we actually know very little of what he really did, and other men were working along these very lines in the manufacture of arms at the same time. Certainly many other men contributed as much or more than Whitney, and evidence for their work can be found which is far more convincing than Whitney's boasting claims."

But why should anyone care now? Does it matter if school boys are led to admire him excessively?

Professor Woodbury thinks it does, because: "The history of our industrial growth is of first importance to our understanding of our American heritage. That industrial development cannot be properly understood without careful consideration of its technological basis. The true story of the 'birth of American technology' is, therefore, of prime concern."



A CITATION went to this design for the Riverview Redevelopment Project in Cambridge in *Progressive Architecture's* design awards program this year. The architect was Edwin T. Steffian, '21, and the rendering was by Marilyn Fraser, '55. The plan is for the redevelopment of two irregularly shaped acres along the Charles River for upper-middle-income apartments under stringent zoning rules.

Professor Woodbury's 6,000-word paper on "The Legend of Eli Whitney" will be published in full by the Society for the History of Technology in its quarterly, *Technology and Culture*, next summer.

## Viruses and Cancer

BY NEXT SEPTEMBER, new laboratories on the eighth floor of the Dorrance Building at M.I.T. are scheduled to be completed, for work which should help to clarify the possible relationship of viruses to cancer. Dr. Salvador E. Luria, Professor of Microbiology, believes that viruses could cause certain types of cancer and will explore this possibility.

The laboratories will provide facilities for research into cellular biology with special reference to the relationship of individual molecules to the living cell. The cell is the starting point of life and is the key to a much deeper understanding of both life itself and the diseases that attack living organisms. Viruses are the puzzling agents that cause a host of diseases in man, animals, and plants. It is not really known whether viruses are living or not, since they are incapable of independent existence, but it is known that they can and do infect cells, existing in them as parasites.

Specific topics that will be stressed in the new laboratories will include tissue culture, animal and plant viruses, growth and differentiation in animals, and the biosynthesis of protein in the living cell. This work will fit in well with current programs in microbiology, physiology, biochemistry, and biophysics, and the post-doctoral medical research program under which doctors carry out advanced and specialized studies at M.I.T. At least one Faculty member and a number of graduate students will be added to the Department of Biology, and the staff of the new laboratories will number about 30.

"There is a tremendous need to go into cellular biology," says Dr. Irwin W. Sizer, who heads the Department.

"We want to study the size and shape of individual molecules and the role that molecules play in the cell. This is a major development in the study of cell biology and the life sciences at M.I.T."

This research program was made possible by a \$100,000 grant from the National Institutes of Health, which will be matched with M.I.T. funds.

## Stepping Out Was Tough

RED SMITH, The New York *Herald Tribune's* sports writer, recently devoted a column to the 101-day, 5,286-mile voyage of John R. Dahl, '58, who now works for the Evinrude Company in Milwaukee, and a 67-year-old California writer and photographer, John Edwin Hogg. They crossed America by boat (up the Hudson, down the Illinois, up the Missouri, and finally down the Snake and Columbia rivers) to Astoria, Ore., from New York City. When asked what was their toughest problem, Mr. Smith wrote, Mr. Dahl replied:

"Well, Mr. Hogg was 67 and I was 30—and girls in those age brackets don't run together much. Our biggest problem was double-dating."

# Pegasus Cast in a New Way

*A simple and inexpensive method of helping the sculptors has been developed and demonstrated in M.I.T.'s foundry*



Alfred Duca produced this and other work to test the new casting method.

THE M.I.T. Foundry Laboratory has perfected a revolutionary technique — not in the field of science, but in art.

For more than a year, Alfred Duca, a Boston artist, has been a member of the Metallurgy staff, doing research in statuary casting. His association with the Institute resulted from a meeting with Howard F. Taylor, '46 (who holds the country's first endowed chair in foundry metallurgy), at a Duca exhibit in the Mirski Gallery of Art. Both Professor Taylor and the sculptor lamented the decline of art casting in this country, and were interested in reviving art casting for its intrinsic cultural value.

Casting has restricted American sculptors. The special techniques required are time consuming and expensive, and this country has few foundries for artists. There is only one in New England, and New York has only three.

The usual method of making a statue involves preparation of a wax or plaster replica the exact size of the finished object; sometimes a small model is made by the artist and a larger replica is made by a craftsman. Plaster is the more economical of the two media and, when it is chosen, the model usually is made in segments which are used as patterns. Traditional foundry practices are suitable, but extremely fine molding materials are required, and the work is done tediously by hand. The cast pieces must be cut, filed, shaped, burnished, and joined into place, and this requires a high order of craftsmanship.

"Young Americans have found that they could make more money working on mass production assem-



Pegasus went to the Kresge Auditorium to pose for The Review's cover.

bly lines than as apprentices or artisans in art casting," says Professor Taylor. "The consequence is that most casting of fine sculpture must now be done in Europe."

M.I.T. and Al Duca jumped into this situation with zeal, supported in part by a grant from the Rockefeller Foundation Department of Humanities. One of their aims was to adapt various sculpturing media to traditional foundry techniques in ways which would enable an average foundryman to do the artists' work satisfactorily and economically. This would greatly extend the sculptor's freedom of expression. Now, after 10 months of research, they have a new, simple, and inexpensive method of statuary casting which can take its place beside 5,000-year-old methods.

It is actually a simplification and improvement of the so-called "lost wax" process of molding sculpture, which was first used in Egypt and China thousands of years ago. The lost wax method is used principally to make hollow castings. A plaster armature is first made, then coated with wax, which is sculptured and covered with plaster. The plaster mold is dried and hardened and

heat is used to melt the wax, which runs off, or is "lost." Molten metal is then poured into the mold, taking the place of the wax. When the metal has hardened, the mold is removed. This process is generally used only for casting bronze, gold, and silver objects.

The bronze Pegasus shown on the cover of *The Review* was made, not from the traditional model of clay, wax, or plaster, but from expanded polystyrene, the fluffy white material used by decorators and florists. This example of Mr. Duca's work is about 2½ feet

high and weighs 400 pounds. It took him six weeks to whittle Pegasus with a grapefruit knife and small, coarse files.

This beautiful snow-white form was placed in a large flask, or box, in the foundry and surrounded with sand. Channels for guiding molten metal into the mold had been made of polystyrene and "glued" to the body of Pegasus, and molten bronze was poured into the mold at a temperature of 2300 degrees F. When this fiery mass struck the original statue, the polystyrene was vaporized, and beneath

the mound of sand, 38 seconds later, stood a bronze Pegasus.

The advantages of this casting technique are several. It means that artists can design with more flexibility—a sculpture with complex surfaces will be no more expensive than a simple one. The process is fast and does not present annoying problems of fitting and joining. Aesthetically, too, this method has significance. A sculpture so produced has the organic vitality of initial creation. Its integrity is unquestionable; the model has become the statue.



The sparks flew on many occasions while Prof. Taylor and others were working with Mr. Duca on the new technique.

# The Larger Learning

*Life demands that the colleges emphasize human as well as the intellectual virtues*

BY HUSTON SMITH

IT LIES within the nature of man to want for his children the best he can provide. Some of the provisions he can transmit are material. But there are other endowments, equally important but less external. These consist of the heritage of knowledge, skills, appreciations, and motivations that keeps each generation from having to start the human venture from scratch. This is where education enters.

In the past it always has been assumed that education should encompass values as well as skills. This is obviously true in simple societies. But in civilization, too, education historically has sought to impart values as well as devices. Thus today in America we find that almost every statement of objectives for primary and secondary schools will include moral development among its stated goals.

Higher education, too, has values to which it is deeply committed and which it seeks wholeheartedly to transmit to its students. But the values of American higher education are specialized. Catalogue statements to the contrary, the truth is that — with the exception of schools that are genuinely, not just nominally, church related — the American college today does not see it as its task to further *human virtues* as a whole. It restricts its responsibility to the *intellectual virtues*.

These latter are not inconsiderable. They center in an intellectual attitude which can be described, simply, by saying that it finds the mind's progressive disclosures of life and the world exciting as well as profitable. It wishes, therefore, to discover more of life and the world, and to see these more as they are.

Analyzed, this intellectual attitude yields the following specific intellectual virtues as ingredients:

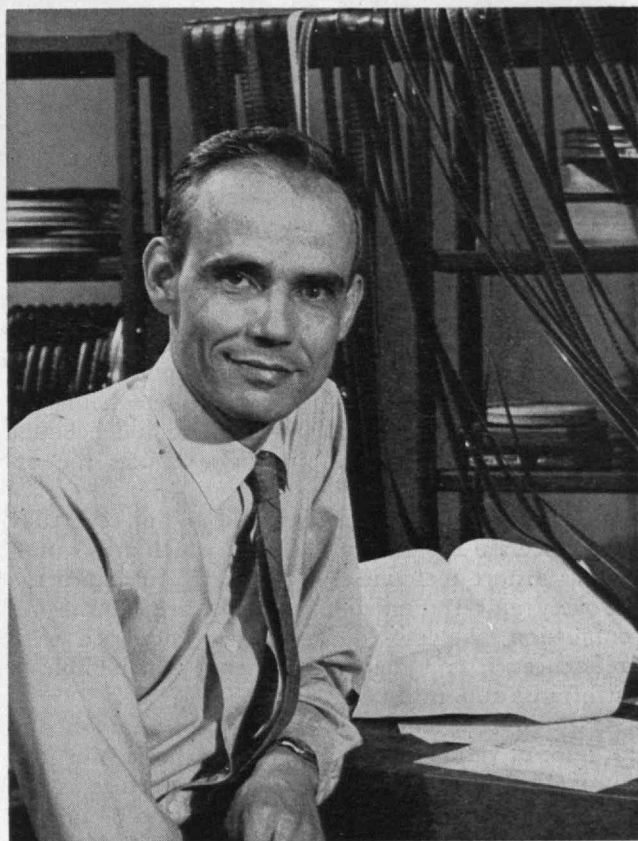
❑ Intellectual honesty — the determination, insofar as possible, to keep personal bias from distorting one's vision of things.

❑ Scope of knowledge — other things being equal, a rich and varied stock of information renders life more interesting and competent.

❑ Dialectical agility ("sharpness") — not only should minds be informed; they should be able to work with their information nimbly, skillfully, and in orderly fashion.

❑ Aesthetic sensitivity.

These are the values in which colleges as institutions really believe. In promulgating them, however, teachers find that they entail several other values as supports. Chief among these are diligence, moral honesty, and academic freedom. If the students don't work, they don't learn. If they cheat or plagiarize,



HUSTON SMITH, Professor of Philosophy, came to M.I.T. from Washington University in 1958. He has appeared in three series of educational television programs — "The Religions of Man," "Science and Human Responsibility," and "The Search for America" — which have been seen in many cities. This article is an abridgment of the first chapter of *The Larger Learning*, a book edited by Dr. Marjorie Carpenter, to be published this year by W.M.C. Brown Co., of Dubuque, Iowa.

teachers cannot gauge their intellectual positions and needs. If teachers cannot teach what, and as, they feel they should, their effectiveness in transmitting the intellectual virtues is curtailed. Obviously diligence, fair play, and autonomy involve qualities which extend beyond the intellectual virtues proper, yet each is directly related to the intellectual life. If we use the phrase *academic virtues* to include these supporting virtues along with the strictly intellectual ones, we can

say that it is this wider category that the American college is concerned to foster.

But this is as far as we can go. Public relations statements may profess the college's concern to develop moral character, citizenship, or spiritual growth, and certainly many instructors as *individuals* conceive their mission partly in these realms. But the general feeling among faculties is that virtues of this sort are not the responsibility of the college as an institution.

\* \* \*

Why do they so feel? There seem to be five contributing reasons. Their relative weight varies from teacher to teacher; together they have led most teachers to the position just described.

1) The continuing force of the *Enlightenment view of man*. This view held, in essence, that reason is the key to the good life. Free the mind of superstition and ignorance, and it will prove both capable of discerning the good and persuading the rest of the self to follow it. Those who hold this view are not morally disinterested. They simply believe that the intellectual virtues provide the best leverage for moral growth. Jefferson was their American prototype.

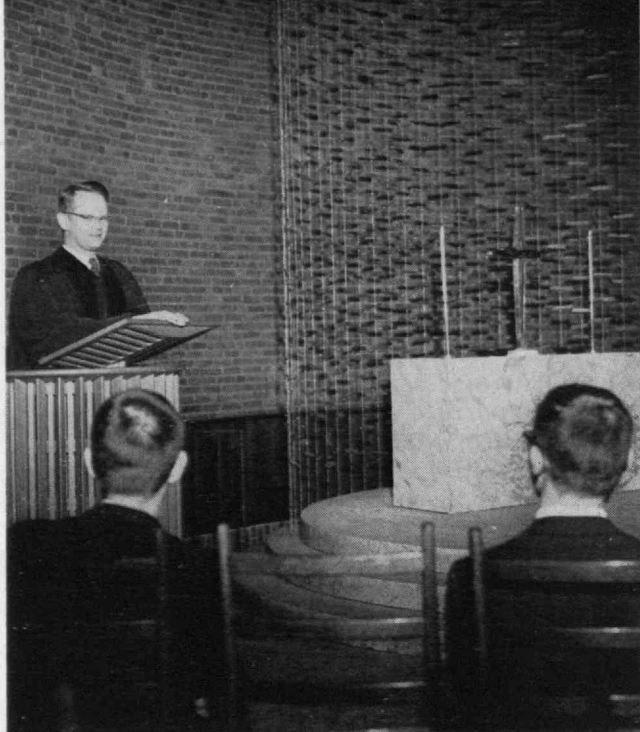
2) The belief that *all values are relative*. Various current doctrines of philosophy and the social sciences have created an impression in the academic mind that values are arbitrary in the sense of there being no universally valid standards by which to judge better from worse. Such a view obviously reduces the urgency of value instruction.

3) *The cult of objectivity*. History and everyday experience are replete with cases in which men's preferences distort their view of the facts. And since the discovery and transmission of truth are education's commission, the less education gets entangled with preferences, it is argued, the better it will be able to perform its appointed task.

4) *Division of labor*. This viewpoint accepts the importance of values and their need for special nurture; but it denies that the place for such nurture is the college. Complex societies require division of institutional function. And in our society, home and church look after moral values; the school, the intellectual ones.

5) *Respect for autonomy*. Our times are witnessing mass onslaughts on the individual, all aimed at trying to make him over from the outside. Let us keep one corner of this crowded world free of such calculated aims. Grant that left to shape their own values, some students will emerge worse than if they had received more direction. But such casualties are small compared with the loss of freedom, individuality, autonomy, and subjective selfhood which must result from any effort to imbue students as a mass with standardized values, however noble these may be in their own right.

There is so much truth in these positions that even if we believed each needed some qualification we might be tempted to consider their combined weight overwhelming. We might well accept this conclusion and leave higher education to its academic values exclusively were it not for one fact. That fact is the present condition of Western man.



For a hundred years now this condition has drawn mounting concern from its most perceptive observers. Diagnoses and prognoses differ widely in detail, but on two points there is concert: the sickness is acute, and its locus is in the realm of values.

Our trouble is most visible when approached politically. The most obvious fact of our time is that the West is locked in a political conflict with survival itself the stake. Two years ago we could face this conflict with assurance; now it seems we must scramble even to match the power that is building up against us. Why? Many reasons contribute, of course, but the prime source of communism's vitality lies in the clarity of its objectives, its sense of historic mission, its confidence in its world view. It is conviction in these matters that gives direction to the communist world and motivates its citizens; *this* is what lies at the heart of its spread, its Sputniks, its "great leap forward." The Russians and Chinese are excited about something to the point of being possessed.

Now men possessed can be more terrible than armies with banners. But what of men unpossessed? And is this beginning to look suspiciously like us? It often looks as if, where our adversaries have something to believe in — communism — we have something to disbelieve in — communism likewise. But as Whitehead said in a different context, if man cannot live by bread alone, still less can he live by disinfectants. Unless we succeed in firming up a core of values in which we as a people believe as fully as the communists believe in theirs, we stand well to lose this struggle.

\* \* \*

Purely political considerations, then, force us to ask whether higher education's exclusive attention to intellectual and academic values is adequate. But the matter should not rest here. For though the political argument is a powerful one, in the end it is a poor one. The real reason for questioning the universities'

current stance toward values is not that communism requires it. The real reason is that life requires it.

The pertinent points, here, are three:

¶ Some core and hierarchy of value convictions is essential to human well-being. To be totally at sea with respect to values, continuously and acutely in doubt as to what is better and worse, is intolerable.

¶ If some value structure is essential to man's well-being, it is equally true that certain structures are superior to others. A decade ago anthropology, psychology, and philosophy might have challenged this statement. Today advanced thinking in these fields tends to confirm it.

¶ If it is important that men have values, and if it is important that they have certain values rather than others, it is equally important that these values pervade the culture as a whole.

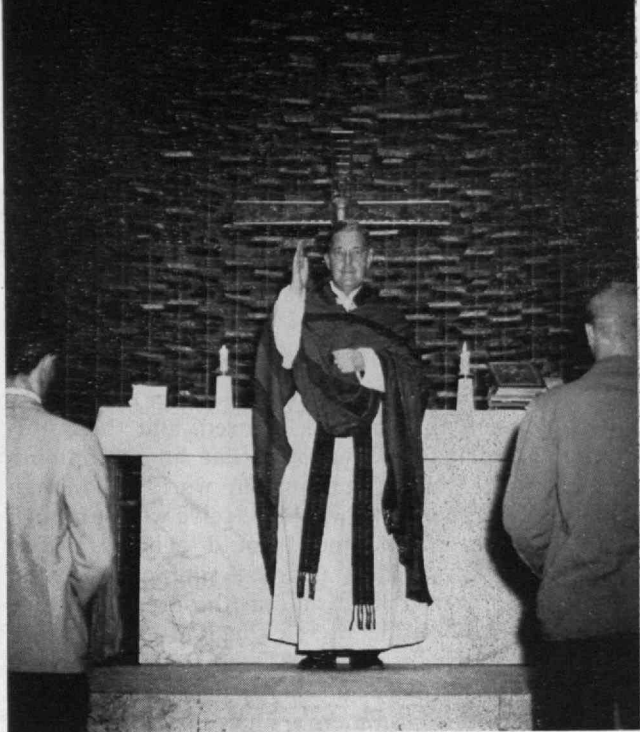
Overwhelmingly men and women derive their values from their culture. We have outgrown the exaggerated individualistic approach to physical welfare altogether with regard to health and to an appreciable extent in economics. No one doubts that health is a communal problem, that unless there is collective responsibility for sanitation, water purification, quarantine, and at times inoculation, the individual is helpless. Any teacher who championed letting students work out their own health conditions would feel a bit foolish; we even compel Christian Scientists to take physical examinations. Yet somehow when we turn to other values their social character drops from sight. The individual student suddenly becomes omni-competent, and *laissez faire* and rugged individualism carry the day. Alas, the truth lies far from such notions. Basic, deep-lying values are closer to the air we breathe and the water we drink than the artifacts we privately erect. Let water become polluted, or air, and individuals are defenseless.

\* \* \*

Not only communism, then, but life itself requires that we re-examine the five reasons that currently persuade teachers to restrict their concerns to academic values to see if, in the face of our needs, they still appear sufficient.

1) The *Enlightenment view* maintains that reason is an adequate guide to the good life. Yet the strongest currents of Twentieth Century thought, even academic thought, challenge this hypothesis. No one argues that reason is irrelevant to the good life. But can it, unaided, spot which values are right? In other words, are values objectively demonstrable? And, if so, is reason's control sufficient to dispose men to follow its goals in the face of temptations to the contrary? On the whole, evidence seems to answer both questions in the negative.

2) *Value relativism*. How many students have concluded from this phrase that floats so freely over college campuses that one thing is as good as another? Yet frontier work in anthropology does not point to unqualified value relativism. "There is a growing tendency . . . for anthropologists to [try] to find out what moral principles are universal because universal conditions of human living give rise to them," says Robert Redfield, adding, "I am persuaded that cul-



tural relativism is in for some difficult times." Similarly strong tides against value relativism are now apparent in psychology and philosophy as well.

3) *The cult of objectivity*. Understood positively as the determination to keep personal bias from distorting truth, objectivity is invaluable to the intellectual quest. Yet some fields require empathy and allied qualities of understanding. Peguy tells us the true historian should be not *desinteresse* but *passionné*. Even where values are not essential to vision, and can obstruct it, need they do so? It is simply not true that teachers who have the weakest commitments see things clearest. What education needs is neither teachers without commitments nor ones who try to check their commitments when they step onto the campus. It needs teachers who have the sense to see where convictions are likely to refract the truth and who will take pains in such cases to try to compensate for their refraction.

4) *Division of labor*. If to be concerned for values and their transmission required that teachers subtract time and attention from subject matter, the "division of labor" plea might stand. But does it require this? I can only report that the teachers who did most for my values did most for my understanding as well. For it was not as if their concern foreshortened their learning; it infused it with blood and sap—the trees of knowledge and life growing together. As we come to think of it, there seems to be something like an in-built protection against values detracting from subject matter, for to the extent that teachers go out of their way for values, simply dragging them in, they moralize and preach, and such devices never succeed. They boomerang.

5) *Respect for student's autonomy*. This is certainly a valid ideal. But obviously it cannot mean that we should not try to influence students at all. Where, then, is the line between legitimate influence and indoctrination? The point of division can only be in terms of the worth of the influence to the student him-

self. If the values conveyed increase the student's usefulness to the teacher, the economy, or the state primarily, and if free discussion is restricted and relevant data are prescribed, the student has been indoctrinated. But if there really are values which are indispensable to the well-being of the student himself, his autonomy will be infringed if these are denied, not if they are supplied. Not to care about imparting such values is not to care about students.

\* \* \*

Enlightenment philosophers believed, and their spiritual descendants still believe, that an uncontaminated reason looking out on the world of human doings and consequences would perceive without much difficulty how sensible men should behave. Unfortunately the situation is not this simple. Evil men prosper; the wicked flourish like the green bay tree and the good die young, often enough at least to make such sayings proverbial. What empirical facts could one hope to find that would persuade the horse trader always to give his customers a square deal? The truth is that if this is a moral universe it is not so obviously one that a college student is likely to discern the fact singlehandedly any more than he would be likely to stumble onto Newton's laws. From a reasonably clear-eyed but uninclined observation of the moral scene, he would be likely to conclude almost nothing. But let him get hold of a postulate; let him be brought to the conviction, for example, that "he that seeketh his life shall lose it" and—here is the difference between theoretical and practical reason—let him work his life into such a postulate and begin living according to it, and behold, the facts of experience will confirm it, even as they do Newton's laws.

This is why Plato says the student needs to be helped in this area; he needs to be educated in poetry and music for then "when reason comes, he will greet her as a friend." It is why Aristotle says that only pupils trained in "ordinate affections" will be able to perceive the first principles of ethics.

There is one other point on this matter of autonomy and indoctrination. Teachers may hesitate to influence student values, but we should never forget that there are other agents in society that have no trace of their squeamishness. Propaganda dispensers in the true and dangerous sense of that word din our students' brainpans from morning to night. No wonder we retreat, determined to have no part of such exploitation. But if true values do exist, not to help our students discover them is to leave them prey to lesser ones.

\* \* \*

Finally, I want to mention briefly three great questions that follow if the thesis that has been stated is accepted. If there are values other than the intellectual-academic toward which the college should assume responsibility, what are they, can they be transmitted, and if so, how?

First, what are they? Despite all our talk about the relativity of values, I doubt that there is much dis-



agreement on this question. Aldous Huxley in *Brave New World Revisited* speaks of the need for a set of generally accepted values based on fact and comes up with the following:

The value, first of all, of individual freedom, based upon the facts of human diversity and genetic uniqueness; the value of charity and compassion, based upon the old familiar fact, lately rediscovered by modern psychiatry, that . . . love is as necessary to human beings as food and shelter; and finally the value of intelligence, without which love is impotent and freedom unattainable.

This statement does not close the question, but I am not concerned here to carry it further. Let me say only that I do not see this question as the difficult one.

The next question — can values be taught? — is more vexing. Life's opening years are so important for the structuring of personality that it may be doubted whether anything important in value re-direction can occur thereafter. Yet there are points in the college experience where things appear to happen; and this intuition forbids us to let this question go unpursued.

Finally, how should values be taught? Happily, we are not entirely in the dark as to how students may be helped to discover and to internalize values. We know that example and habituation are crucial — and a campus ethos, a "style of life" embodying judgments, implicit and expressed, as to what a given community of scholars considers appropriate is important.

There are topics I cannot here expand. I hope only that the reader may share my feeling that they are a fascinating and, more importantly, a crucial set of issues. For they are concerned, as Plato put it, "about matters which to know is honorable and not to know disgraceful; to know or not to know happiness and misery — that is the chief of them. And what knowledge can be nobler? or what ignorance more disgraceful than this?"

# New Demands in Engineering Education

*Today's student must be prepared to cope with greater changes than his predecessor, and needs the guidance of a professor who has real insight into the new fields*

BY HAROLD L. HAZEN

OUR SCIENCE and technology have become very sophisticated. Even more important, the rate of change of sophistication and complexity is very large, and over the recent decades this rate has been increasing rapidly. The implications of extrapolation become almost overwhelming. How can we, in the brief span of a few years after high school, prepare young people to join the professional ranks and to pick up their share of work, contributions, responsibility, and eventually, leadership?

That a serious problem in education is involved is clear. This problem of coping educationally with "new technology," of course, is not new; technology has been growing continuously since its inception. Each new element of growth from a new impact of science, and invention, a new art, or the emergence of a new application, has called for a corresponding response in the education of new recruits to the profession. Yet we sense that in some way today's situation is different from that, for example, at the turn of the century.

In 1900 a four-year undergraduate engineering program of elementary classical science, and some introduction to the art of engineering, provided an adequate foundation for the following 40 years. Our 1900 graduate, of course, had to be prepared to learn about new developments, and to add to his scientific preparation, but in a way that appears rather simple in retrospect. The 1965 graduate must be pre-

pared to cope with far more radical changes if the obvious extrapolations of the past two decades have any validity. If he is to keep up with his profession and exercise leadership he will undoubtedly have to turn student and learn, during his professional life, not merely a few increments or extensions to fields learned as an undergraduate, but rather some entirely new field that may not yet have emerged from the research laboratory. Indeed, he may have to learn not one such new field, but two or even three at successive intervals during his career.

The recent rate of emergence of new science and its engineering applications imposes an entirely new level of demand upon the educational process — in developing the capacity to learn, and upon the character and quality of the intellectual foundation. Indeed, the whole scale and the dimensions of the demand for new learning that these rates of change impose are so greatly different as to make the new demands on education essentially different in kind from those of former decades. As never before, we must emphasize, not merely learning, but more importantly, learning how to learn.

## *The Profession's Foundations*

So let us ask ourselves how we would characterize an engineering program for the next decade that will be useful to the 1970 graduate who expects to practice engineering from then until the year 2010. What



*HAROLD L. HAZEN, '24, Professor of Electrical Engineering and Dean of the Graduate School at M.I.T., spoke at a Conference on Scientific Manpower during the recent meeting of the American Association for the Advancement of Science. This article was drawn from that address.*

kind of educational experience will best serve the purposes of this neophyte?

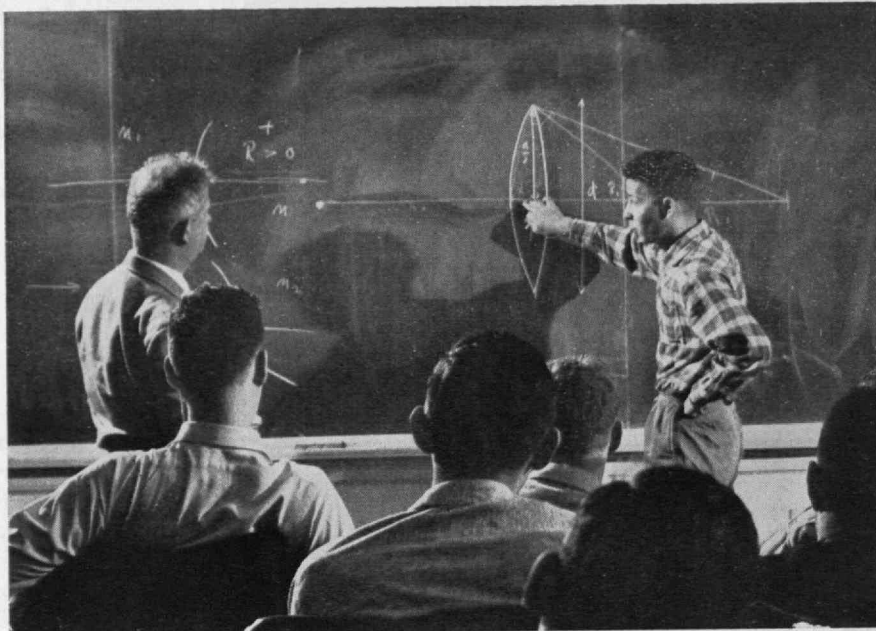
One of the foundation elements of an engineering education that is being increasingly recognized as of first-order importance, not only culturally but practically, is general education. By general education, I mean a serious introduction at the college level to our civilization, our culture, and the world of the mind and of values, by way of some challenging experiences in the humanities, in the social sciences, and in the natural sciences. This civilization and culture cannot be that only of contemporary America or the Western World; it needs to provide far wider perspectives in both time and geography. The engineer's attitudes and awareness can no longer be provincial. Wisdom, never in oversupply, is recognized as increasingly vital above and beyond intellectual competence. More than ever before, the engineer must be a well-educated person.

A second foundation element of an engineering education above and beyond general education, which for the engineer naturally would include strong basic science,

is the emphasis on science at a more advanced level, and with some applied flavor, in what we may call engineering science. This element of an engineering education always has been important.

It is even more important for the future. But beyond that, the outlook and quality of this education face new demands because of the future requirements faced by our 1970 graduate. In mathematics, for example, our new engineer must go well beyond the calculus and differential equations of my undergraduate days with their problem-solving emphasis. Our engineering student of tomorrow must give far more attention than we did to developing some appreciation of the methods of thought of the mathematician and of the rigor with which he examines, validates, and indeed develops new areas of mathematical thought. The mathematicians — not the engineers — are still going to produce the new mathematics; but increasingly the engineer must be prepared to communicate knowledgeably, and to work with his mathematical colleagues in order to understand new areas of mathematical endeavor, because these have become important in engineering. To do this, he must have at least some appreciation of the character of mathematical thought.

The same kind of outlook will be required in the experimental sciences. The engineer is not about to become a physicist or chemist. But the good engineer inevitably is being drawn closer and closer to his science colleagues. One example illustrates the point: A low-noise amplifying element, embodying a crystal of ruby operated at an absolute temperature of four degrees Kelvin in a helium cryostat, in order to achieve extremely low noise levels, and thus permit detection of an unprecedentedly low level of radio frequency power, sounds like a perfectly good piece of physics research laboratory equipment. But it enters the realm of engineering when it is installed and operated out in the weather 100 feet above the earth at the focus of an 80-foot diameter parabolic radio antenna to grasp the greatly increased radio and radar ranges thus opened up. This example is merely one of hundreds that can be cited today, to suggest that the science



foundation in engineering education faces major new demands of rigor, of depth, and of breadth.

#### *Evolutions of Thought*

Another characteristic of the science foundation of engineering has also been clearly evolving in recent years. This is the intermingling, interacting exchange increasingly occurring among the conventional engineering fields. For example, our teaching of the dynamical behavior of lumped-parameter systems is beginning to recognize the mathematical unity among the dynamics of discrete bodies, fluid systems, electric circuits, electromechanical elements, and chemical processes. We can be grateful to the field of servomechanisms and feedback control for forcing to our attention the educational gains that accrue from freely striding across the boundaries of these previously separately developed fields.

In the continuum, that is, phenomena involving extended distributions in space, or field phenomena, the educational exploitation of the basic mathematical similarity of electric, magnetic, thermal, elastic, and fluid-flow systems has great potential to extend intellectual horizons and deepen understanding. Thermodynamics similarly takes on far greater intellectual significance, as well as greater practical utility, when it is concerned broadly with the fundamental study of energy, its transformations, and its relation to the status of matter generally in a

variety of fields involving chemical, phase, electric, and mechanical phenomena, than when it is restricted merely to sufficient theory to permit calculations on a few conventional kinds of heat engines.

In a somewhat parallel way, a fruitful new conceptual synthesis relating a wide range of phenomena appears to be evolving under the general heading of transfer and rate processes. This concept of transfer and rate processes brings together for common mathematical analysis and study a wide range of such diverse phenomena as transport of matter, momentum, and heat, including chemical reactions. Similar and major cross-fertilizations and interactions in thought processes are also occurring in other areas, such as materials, and information theory, and information processing.

These evolutions of thought have been emerging during the last few years in response to the urge for more generality, greater unity, and deeper insight, as well as economy of time, in this "second-time around" study at the engineering-science level of the mathematical and physical sciences by the engineering student.

A third foundation stone for engineering programs of the future is the introduction of the student to the engineering method, or what now is often called engineering synthesis and design. When rates of technological change were less, we suffered less from outdating when we taught the specific art of engi-

neering. Under present conditions such art is at least obsolescent when it is taught, and completely obsolete before the graduate can try to use it. We therefore are discarding the teaching of specific art as educationally unsound, and instead stressing methods of thought, that is, the methods by which new problems are approached, by which their essential elements and components are identified and analyzed, and by which valid solutions are synthesized. All these involve original thinking, exercise of judgment, and decision making.<sup>1</sup>

Emphasis is also being given to what has been called the "open-ended" treatment and attitude. This contrasts with the "bounded" treatment which presents a subject as if it were sufficiently well understood so that our task would be done when we mastered it. The open-ended attitude, emphasizes the questions that remain unanswered, the areas that are still to be explored, and the limitations upon our existing knowledge, thus challenging and beckoning the student on. This impresses upon the student the vital fact that learning is an ever-continuing process.

These foundation stones make only a foundation unless they serve to support creative activity, that is, the achievement of new devices, of new and better solutions to problems, and of new knowledge and art.

#### *The Levels of Learning*

Can we do all of this in four years, or must we seriously consider at least an additional year? This question is as old as American engineering education. Following World War II a few schools did adopt the five-year program. The idea has not spread, however, and I see no significant trend in this direction. The consensus of judgment seems clear that the development of intellectual power, of scientific and engineering discipline, of courage and insight to attack new problems, of breadth of outlook and sound judgment in their solution, rather than encyclopaedic grasp of subject mat-

ter, is the fundamental objective of an undergraduate experience in engineering education. The conviction is generally held that the bachelor's degree at the end of a good and continually evolving four-year undergraduate program is a valid and useful termination for this first stage.

Graduate study worthy of the name, even at the master's level, calls for aptitudes and a quality of mind that will benefit by more advanced and more demanding formal study. At the graduate level there are, and should be, opportunities for several kinds of student interest.

There is the student who wants to go somewhat further in the areas opened up by his undergraduate work. He would like a little more mathematics, perhaps more physics, and wants to examine at a somewhat more advanced level some of the newer developments. Another student may want to go somewhat further, in a two-year "engineer" program available at some schools, aimed essentially at the development of more technical competence and insight in solving technically sophisticated, practical engineering problems. Then there is the student whose aptitudes and motivations urge him toward the more creative and scholarly kinds of activity associated with research or academic activities. He is the doctoral man for whom the demand is very great, both from industry and from our engineering schools. Whether he

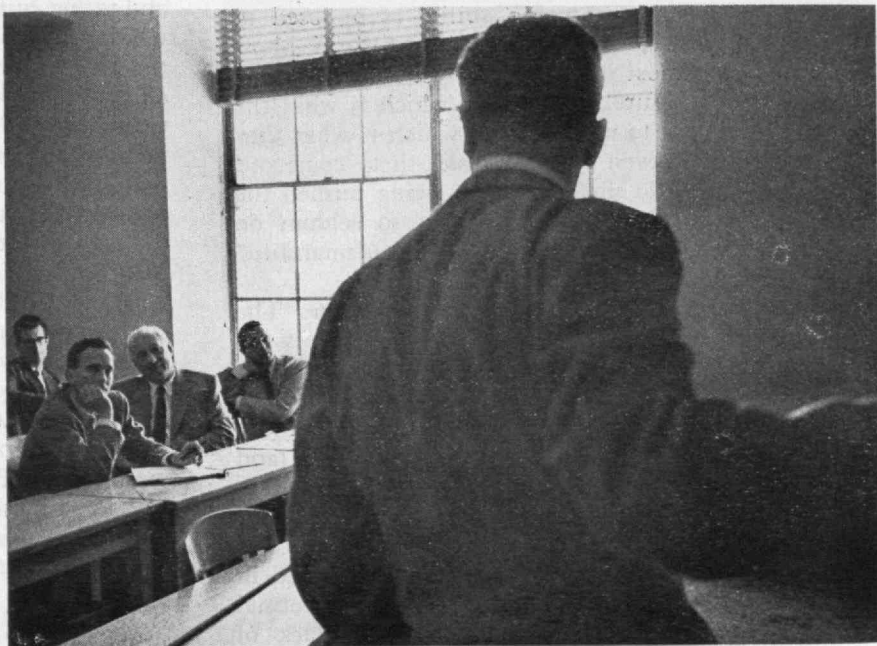
feels attracted to industry or to academic activities is more a matter of his personal interest than of any special educational or intellectual attainments. He is the man who likes to probe deeply, to understand profoundly, to work on problems of high intellectual challenge, to explore new ideas and develop new knowledge, and to be associated with students and colleagues of like interests and qualities.

Graduate work, in engineering especially, raises the question of the residential program versus the part-time study associated with employment in industry. Although both are useful, they serve different purposes. Part-time advanced study can contribute to knowledge and skills in specific fields; full-time residential graduate study has an objective above and beyond this. Just as the residential undergraduate college exerts an over-all influence on the development of the undergraduate extending far beyond mere instruction in subject matter, so full-time immersion in the work and environment of the strong residential graduate school produces changes in the graduate student influencing his whole outlook and attitude. This is the real function of the residential graduate school.

#### *The Faculty Problem*

The anticipated growth in engineering student numbers will require growth in financing, in

*(Concluded on page 42)*



<sup>1</sup>A stimulating exposition of these trends in thinking among engineering educators will be found in the Report on the Engineering Sciences, American Society for Engineering Education, *Journal of Engineering Education*, 49:33-91, No. 1 (Oct. 1959).

# Why Do Good Men Fail?

BY M. BRYCE LEGGETT

With Illustrations by Henry B. Kane

WHILE the Educational Counselor may be mystified when the Admissions Office turns down the boy whom he has recommended highly, he is probably even more at a loss when the really good-looking fellow he interviewed fails to do well after admission. In this case, the "pros" at Tech have agreed that the boy is good; in fact, they have turned down other "qualified applicants" in order to admit him. What has happened? What or who went wrong?

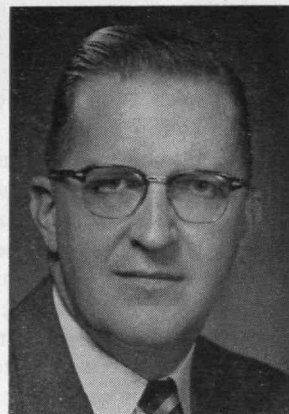
As the result of asking these questions about (and to and with) a group of freshmen who became involved with me in a special advising program—a program now integrated into the activities of William Speer, the Associate Dean for Counseling—I have some guesses as to answers. There are some general categories of response that can be listed. But there do not seem to be any clear-cut, immediate steps we can take to avoid admitting these fellows and I am prepared to plead that such action, if we were skillful enough to know how to do it, might constitute a cure worse than the disease.

One frequently hears the comment that the fellow who fails in his first year is lacking in inherent ability, is inadequately prepared, or has ineffective study habits. These are rarely the real reasons. The required tests are aimed at measuring ability as opposed to memory; they resemble not at all the TV quiz show pattern. It is almost impossible to get results too far from a valid measure of aptitude (which is what the tests are designed to measure and which is what they are called). It is even hard to make them come out too low; or why do smart students being pushed the wrong way and looking for an out so seldom do poorly on them? Test sophistication or "quizmanship" doesn't help either.

Inadequate preparation is not the answer. The student with ability can and does overcome any deficiencies in his schooling; the boy from the one-room high school (we have a few) can be up even with the boy from the most highly rated secondary school in a term or two. He recognizes his weak areas (and these are comparative, not absolute) and works harder on them. In cases where it has been insisted that the sole reason for failure was poor preparation, a second round in a specialized prep school hasn't resulted in a better record at M.I.T. Conversely, the best formal school preparation will not make up for lack of

*Well-recommended, good students sometimes make poor showings at M.I.T., for reasons that epithets neither explain nor remove . . . here are some explanations*

M. Bryce Leggett, '40, is Assistant Director of Admissions at M.I.T. He has worked in recent years with many students who came to the Institute highly recommended, yet failed to do well. Here are his "guesses"—in an article especially written for M.I.T. Educational Counselors—about the reasons for the difficulties that some promising men run into at M.I.T.



ability and certain other qualities to be discussed later.

The question of study habits is a tougher one. There is some evidence that entering students in most colleges do not study effectively. They begin at the top and plod to the end; they concentrate on the trees without ever deliberately trying to identify the forest first; they are systematic to a fault. But this can be remedied. Most of our students do it themselves and rather quickly. They report increasing "efficiency" within a couple of months and, to their amazement, the decrease in "goofing off" time doesn't account for all the improvement. I doubt that any of the students we admit are incapable of developing good study habits quickly—if they "want to."

If they "want to"—this is the important criterion as I see it. Let's say that those who fail at M.I.T. all fall in the category of difficulty in this area (except for the few for whom we've ignored the practical limits because we believed that motivation was high enough to overcome a marginal ability).\*

But having made that glib comment, we are faced with the real question about our failures. Why did they not want to do what had to be done to get satisfactory grades here? Laziness? Weak or spurious motivation? Personal problems? Something about M.I.T. as it is? Or as it seems to be? All of these are observable reasons for failure, and there are undoubtedly more.

\*Incidentally, no matter where you put the margin, there are always marginal cases.

Laziness is an easy term to apply. It is not so easy to justify. The boys we admit should be able to carry the academic load we place on them and have some time left for other activities in addition to eating and sleeping. This is our aim, and most do. So one asks what else he is doing with his time, where is he putting his effort, and why? Are his other activities contributing to him as a person? Are they an essential part of his growth to maturity? Ought they, in fact, be for him more important right now than studying? Sometimes the answers are unequivocally "yes!" Is this laziness? Or, again, is his lack of attention tied with those questions of motivation which come next in this outline? Generally, what is dubbed laziness is nothing more than the symptom—when it is anything more than a convenient term of opprobrium with which to flail a youngster because it's easier to flail than to think.

### You Have To Be Gung-Ho

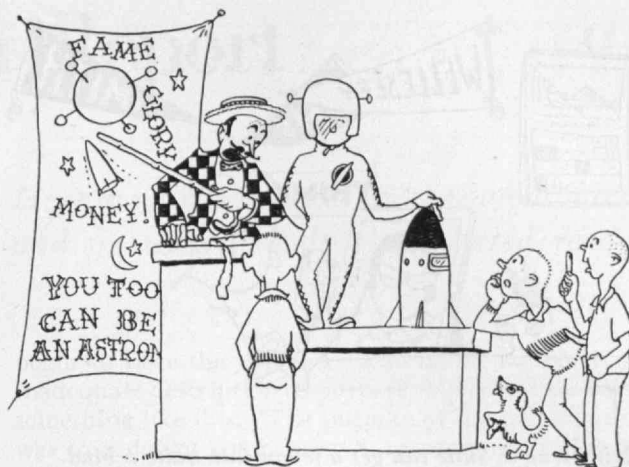
So to motivation. My student friends tell me that "you have to be 'gung-ho' for the things we study here to come out on top." And this is probably true. The student has to see in his studies a source of excitement and personal commitment in order to take the pace. He may see the job he wants; we hope he sees the mind he wants.

Can't we feel sure that a student who enrolls in M.I.T. has adequate motivation? Not yet. This is one of the areas where guidance and counseling of high school students can help, but we have no sure measures or tests to help us yet. There will be the student whose motivation is doubtful; he isn't sure what he wants to be. He is "pretty sure" and he won't admit to people with an M.I.T. position that he is doubtful, especially since he wants to get in. He may never have had to work hard enough at any subject to realize that it is less pleasing than another. This is a problem we must expect when we are attracting top-level minds.

Perhaps a student is exposed to rigorous and adult work in history or the social sciences or literature for the first time, after he enters M.I.T., and finds that when these subjects are presented with the same intensity as are the sciences they are more interesting than science or mathematics. If he does find this out, he may fail to do well here simply because he is not able to devote most of his time to these subjects. Interestingly enough, a frequent indecision of this kind is between physics and music as vocation; the resolution falls about an equal number of times on each side. Here a controlling factor, but not an adequate one for the school boy facing this problem, has been the anticipated relative income from the two professions.

Another spurious motivation seems to be the result of our post-Sputnik insistence on our need for scientists and engineers. The student who wants to be something else is sucked in by the drum-beating and decides to try it. He's serious, he's sincere about it; it just doesn't pan out.

Then, too, there are misconceptions about the term engineering as we use it. The fellow who wants to tinker as an expert and push a slide rule through someone else's equations may well think that this is



*Sometimes the drum-beating sucks in the wrong young men.*

engineering; in many quarters, it is. But at M.I.T. this fellow finds himself in a two-year math sequence that is on the road to a Ph.D. in math and in a parallel sequence in physics that is the start of the Ph.D. physics program. And, he's expected to "do engineering" in this fashion, with these same basic tools and, more importantly with the pioneering spirit of modern scientific advance. He has the choice of revising his idea of engineering or of being unhappy. If the latter, he may fail.

It would be less than candid to omit mention that the motivation of a few is solely to get into M.I.T. This doesn't give the drive needed to do good work after the student is here. A weak motivation, and one that can be inadequate, is to get the prestige of an M.I.T. degree. And, unfortunately, there is also *imposed* motivation, that really belongs to the parent but has been induced in the boy through those subtle and important relationships between parent and child. A boy who has only this to push him on doesn't have a chance to do well.

Sometimes, I think with hindsight, that we have admitted a parent and flunked him out. The tragedy is that the boy has had to do the work and bear the shame and, at least in part, he has had to cope with the heartache.

There is also the romantic student. My first encounter with this type was in my first class: "I want to do research in leukemia, but why should I grub around with quantitative analysis?" We still have these on occasion: it is usually space these days.



*And sometimes it looks as though we had admitted a papa.*



*Being true to Susie can get a fellow into quite a bind.*

Motivation, then, is important and lack of proper motivation can account for failure to do well. But, what about the student whose inherent ability is high, whose preparation is first class, and whose motivation is undeniably strong and true? Sometimes, he fails, too.

### Adjustment Problems

And so we move into the area of personal problems. This is where, in general, the skill and insight of the trained counselor are most valuable and where the layman makes his contribution by being a trusted friend and by being willing to concede that there is a possibility that something very real is here and that simple epithets like laziness, poor study habits, etc., aren't necessarily applicable.

In an age weaned on Freud, with every man a psychoanalyst, it should not be necessary to insist that not all personal problems are apparent in their essential nature to those who have them. The personality has its own deviousnesses. But, let's look at some of the many things that can happen to a fellow so that his efficiency at study is impaired.

He can, of course, be unhappy with M.I.T. Sometimes this is because, as a community, we are quite unlike what he has known and feels congenial in. He may find that our competitiveness (which I think is more often just able minds working hard than aggressiveness) is too much for him. He may (and I've heard this said by students) be aware that we want to educate him broadly and be disturbed that we are making him change too fast. These are, I think, possible reactions of some students to M.I.T. as it is. There are all sorts of reactions to M.I.T. as it is thought to be, but in objective fact is not. Most students adjust to the Institute or any community they join, and most expect to adjust (at least when they are rational). But some can't. They may well fail.

Or, while adjusting well to M.I.T. as he finds it, a student may run into concomitant adjustment problems—away from the community and patterns he formerly called normal. This isn't always easy, or dramatic either. The fellow who promised to be true to Susie, the best girl in Podunk, and now finds that there are scads of chicks at Wellesley who have Susie beat a mile, but who still has Susie back home waiting and being true, is in a bind. He doesn't want to hurt Susie, but, well—how does he grapple with this and do all those problems in calculus at the

same time? Funny? Not for him. This is deadly serious. A more obviously serious possibility is the drastic challenge which Twentieth Century science can give to a philosophy or religion that was learned at home and is a source of security. Some fellows cannot resolve this and do good academic work at the same time.

Another personal "adjustment" problem may arise more frequently in the future than it has heretofore because a larger portion of our students now come to us with extremely strong academic records. A few of these will be uncomfortable with their first set of grades—the all-A student now averages C. If the boy's well-being rests on his grade status, he may have to re-evaluate himself and his aims. Incidentally, this is a case in which parents and school teachers may start throwing such epithets as lazy. This response by parents, usually not correct, doesn't help the student. It's a cruel fact of academic life that any grading system ranges from Excellent to Failure and that the placement in it is determined in the school or college administering it. If all the entering students had all A's in school (M.I.T. does *not* claim such a record!), there still would be a preponderance of C grades in the college with (happily) some A's and (unfortunately) some F's. Somehow or other, since it is the students themselves who determine what the average at M.I.T. will be, there will always be more average students here (M.I.T. average, that is) than any other variety.

There are all sorts of specific problems that can be devil a fellow. And, from the lay point of view, the old idea of possession by devils isn't too far off the mark. Sometimes there is no apparent surface cause, no specific event to grapple with, no adjustment problem that one can see. And yet—things don't go right. We know of boys like this. We offer them the assistance of professional people who can probe deeply and get at the causes—causes no one in school, no Educational Counselor, no Admissions Officer, had any reason to suspect. But they are there. They interfere. They kick up surface manifestations that look like some of the other factors we have discussed. These can result in academic failure, too, if we're not skillful enough to at least hypothesize their existence and skillful enough and trusted enough to get the boy to seek professional help.

### How Alumni Can Help

These paragraphs can leave a dreary idea of students. One gets to think of them as problems if one isn't careful to maintain perspective. After all, more than

*(Concluded on page 44)*



*The old idea of possession by devils may have some merit.*

# When You Write a Report

*Here are six principles to be remembered,  
and six ways to help the hurried reader*

BY ROBERT R. RATHBONE

WHENEVER I hear engineers discuss the headaches of preparing a journal article or a technical report, I am reminded of a remark made several years ago by a friend of mine in industry: "There are some things that engineers hate more than having to write—ten years in Alcatraz or a case of beriberi!" I had never thought of the problem in just that way, yet I had to admit that many technical people do resign themselves at an early age to a sort of "peaceful coexistence" with the English language.

But the situation is not incurable. Engineers with whom I have worked have demonstrated that they can turn out clear, readable writing once they understand the basic principles and are given an opportunity to develop their technique.

My intent in this article is to describe the basic principles as specifically as I can in the space available. I am willing to risk another look at this much-discussed subject because I believe that too often it has been treated in such general terms as to be of little help.

## The Important Man: the Reader

A technical report has a reason to exist only if the reader for whom it is intended will have some use for it. Consequently, all of the principles of sound reporting are based upon reader needs. Every decision a technical writer makes—whether on content, style, or format—must be justified on the grounds that the result will help the reader; each new reporting situation demands a fresh appraisal of the potential audience.

Although appraising the reader's needs for technical content is fairly straightforward (particularly if the report is being written by direct assignment), solving his needs relative to style and format is not. Most of these needs are psychological, and thus differ somewhat from individual to individual. Only those that are common to all readers of technical matter can be predicted, and effective ways to meet them prescribed. Fortunately for this analysis, the common needs outnumber the special needs.

## Needs for a Clear Understanding

The first duty of a technical writer is to convey information clearly. To do so, he must meet these basic needs of the man at the receiving end:

1. *The need for introductory material.* All writers realize that it is important to make a good first impression on their readers. Yet many introductions are so sketchy that readers become hostile even before they

begin to hear the evidence. The main trouble is an inadequate description of purpose. Many writers begin something like this: "The purpose of the investigation was to redesign component X to meet the following specifications . . ." What these writers fail to realize is that their readers immediately ask "Why?" They would do a lot better to begin this way: "System ABC is used for real-time applications at location Y. On October 1, the system did not detect target T. An investigation of the failure showed that component X had not responded to impulse I."

The point to remember is that all readers need at least the major points of briefing that the writer needed before he could begin the investigation. (Even the person who assigned the project wants to be sure the writer understands the problem thoroughly.)

2. *The need for a picture of the whole.* Just as the reader needs a picture of the whole problem in the introduction, so he needs similar guides throughout the presentation of evidence. In order for him to understand a new concept, a new machine, or a new method he must first have a clear idea of the essence, function, and purpose of the concept, machine, or method considered as a whole. He needs an over-all framework into which he can fit the parts as they are described. For example, if the reader is first given a general description of a chemical process, he will be ready to tackle the details of the many steps in the process. The verbal picture will help him in much the same way that the illustration on the box helps the man about to assemble a jigsaw puzzle.

3. *The need for a sound structure.* Once the reader has a picture of the whole, the parts should be presented to him in a pattern that is consistent with the nature of the subject matter. There are many ways of unfolding a story; e.g., development based on time, classification, order of importance, cause and effect, or logical sequence. Usually, one method is better than another for a particular situation. It is up to the writer to find it, and until he gains experience, cut and try may be his only approach. For example, the construction of a device might be described by working from the inside to the outside, from the top to the bottom, or from the left to the right. If the general description does not immediately suggest which method to use, the writer should try several and compare. The one that was easiest to write should be the one easiest to read.

4. *The need for proper levels of emphasis.* All the details of a description will not be of equal importance. (Continued on page 52)

Mr. Rathbone is Associate Professor of English at M.I.T. who has specialized in teaching technical writing.

# Strong Chambers for Solid-Fuel Rockets

*Engineers show what must be done if thin casings are to withstand tremendous stress*

THE LATE Professor Robert H. Goddard and the Germans used liquid propellants in their rockets, and liquids have continued to be favored in big missiles despite the difficulties of handling them and the pumps and other appurtenances required. Solid fuels would be preferable in many instances, but they must be encased in very strong yet very light chambers. It has proven difficult in the past to design and fabricate such chambers.

Maurice E. Shank, '49, Associate Professor of Mechanical Engineering at M.I.T., recently participated in research work with Pratt & Whitney Aircraft engineers, which showed that:

☐ It is possible now to produce a solid-fuel rocket casing 6 feet long and 40 inches in diameter, with a wall only 7/100th of an inch thick, which can with-

stand a tangential stress of 240,000 pounds per square inch, but

☐ The cleanest, vacuum-melted steel available must be used, and handled with great care, because

☐ Even a hydrostatic test with water can cause electrolytic action that will so charge the metal with hydrogen that internal cracking will result, leading to subsequent fracture.

Extreme care must be paid to the details of design and construction. In the successful casings, longitudinal welds were avoided by spinning the cylindrical section of the chamber from a solid, seamless ring forging, and bosses and reinforcements were integral with the dome-shaped heads. Learning these lessons was no small job.

In some respects, the situation reminded the researchers of problems encountered in the failure of welded ships during World War II, and the failure of carbon-plated steel structures before and after the war, but the difficulties were very much magnified in the rocket-chamber problem by the much higher stresses encountered. The stress in the chamber wall is equivalent to that in a one-inch-square rod holding a weight equivalent to that of 80 automobiles.

Exploratory work was begun by building some test chambers only 9.5 inches in diameter and 14 inches long. Then, after ascertaining that small chambers could be built, the investigators proceeded to make a big one—that failed unexpectedly at lower stresses than previously had been sustained.

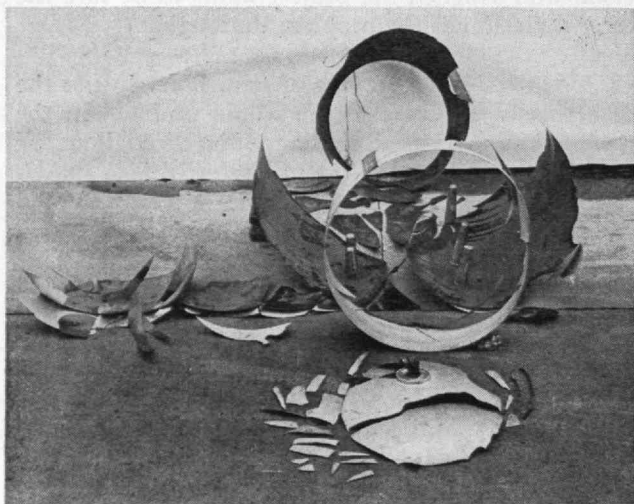
The detective work undertaken then, to find out why it came apart during a hydrostatic test, was long and intricate but led the researchers to suspect that hydrogen in minute quantities was the culprit. A half dozen more sub-sized chambers and a couple of large ones were built and tested in order to be certain that hydrogen caused the trouble. Precisely how it gets into and initiates fractures in steel is not fully understood yet, but a lot was learned in these experiments about making big, sturdy chambers out of metal no thicker than 17 sheets of the paper in this magazine's cover.

Heretofore, it has been presumed that, since a missile only goes up once, its fuel chamber needed only to be made well enough to withstand one or a few severe tests. But now, says Professor Shank, "it has become apparent that a solid-fuel rocket chamber must be designed and constructed well enough to last through many stress applications, and for much longer periods of time than it will be stressed in service.

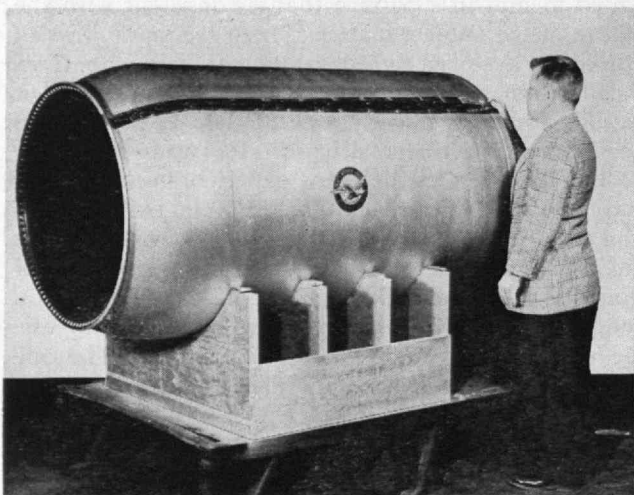
"If it cannot do this, it will not work at all.

"This has been realized in the aircraft propulsion field for many years and is the philosophy used in the manufacture of turbojet engines. If missile casings are to operate in a satisfactory manner, even higher standards of quality are in order."

The research was described in more detail in November and December, 1959, issues of *Metal Progress*.



These are the remains of a full-scale casing that failed.



The experiments showed big casings like this are feasible.



# Seeing Far Below the Sea

BY HAROLD E. EDGERTON

EACH time I look at a globe, I get excited again about the tremendous number of unknown things and facts that must be submerged under the oceans that cover more than half of the area of our earth. The best way to see what is going on would be to go down there in a submarine, like Captain Nemo, and have a look.

Auguste Piccard's bathyscaphes have been taking observers on just such trips. Captain Georges Houot of the French Navy in the FNRS III, for example, has made 70 dives in the Mediterranean, the Atlantic, and near Japan.\* A team of American scientists, under the sponsorship of the Naval Research Laboratory, also made some 25 dives off the coast of Italy in 1958 in the *Trieste*. This bathyscaphe was obtained by the U.S. Navy and

\*This was clearly reported in the *National Geographic Magazine* in September, 1959, and January, 1960.

*More photography in the oceans is needed . . . now dynamic, data-producing cameras are being developed*

was reported recently to have dived more than seven miles in the Pacific, a world's record.

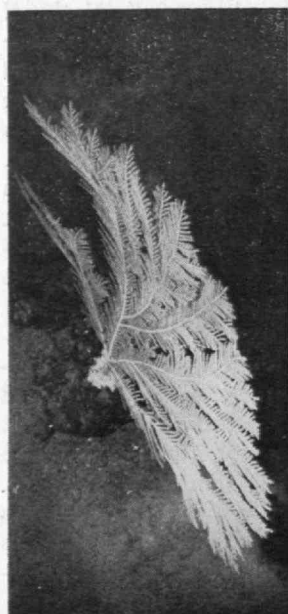
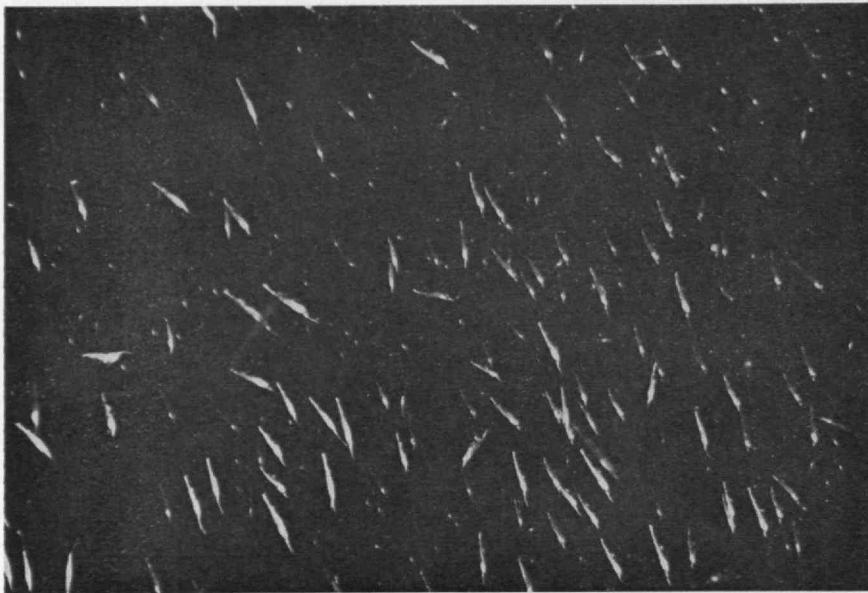
The French Navy is designing a new bathyscaphe capable of diving to the bottom of the deepest ocean. The first bathyscaphes were built to go to only about 15,000 or 20,000-foot depths, whereas the new French one will be capable of going to the ultimate depths known. There is no requirement for a deeper ship unless a new and greater ocean depth is found or a hole is dug.

## *Bathyscaphe Cameras*

It was my privilege to design the flash photo equipment which was used on an early 13,285-foot dive of the FNRS III off Dakar. The

research committee of the National Geographic Society had given me funds to design, build, and send this camera equipment to France for use in the pioneering exploits of this deep-diving submarine. Later, I spent a month in Toulon studying the photography problem. From this study, additional external cameras were designed, which are now in use on the vessel.

Electronic flash cameras controlled by pushbuttons at the observer's position are now standard equipment on both bathyscaphes. The photographs are one of the most valuable results of the dives, because they remind the observers of what they saw and enable others to see the actual scene at the bottom.



The dense zone of marine life (at top of page) was seen from one of the bathyscaphes.

The starfish clinging to the bottom at a depth of 6,300 feet were off the U.S. eastern coast.

The Gorgonian plant (at the left) was found in a photograph taken at a depth of 2,600 feet.

Professor Edgerton descended in a bathyscaphe last summer near Guadeloupe. Peter Gimbel took the picture on the preceding page then.

On the next page you see how data now are recorded on photos so that they cannot be lost.

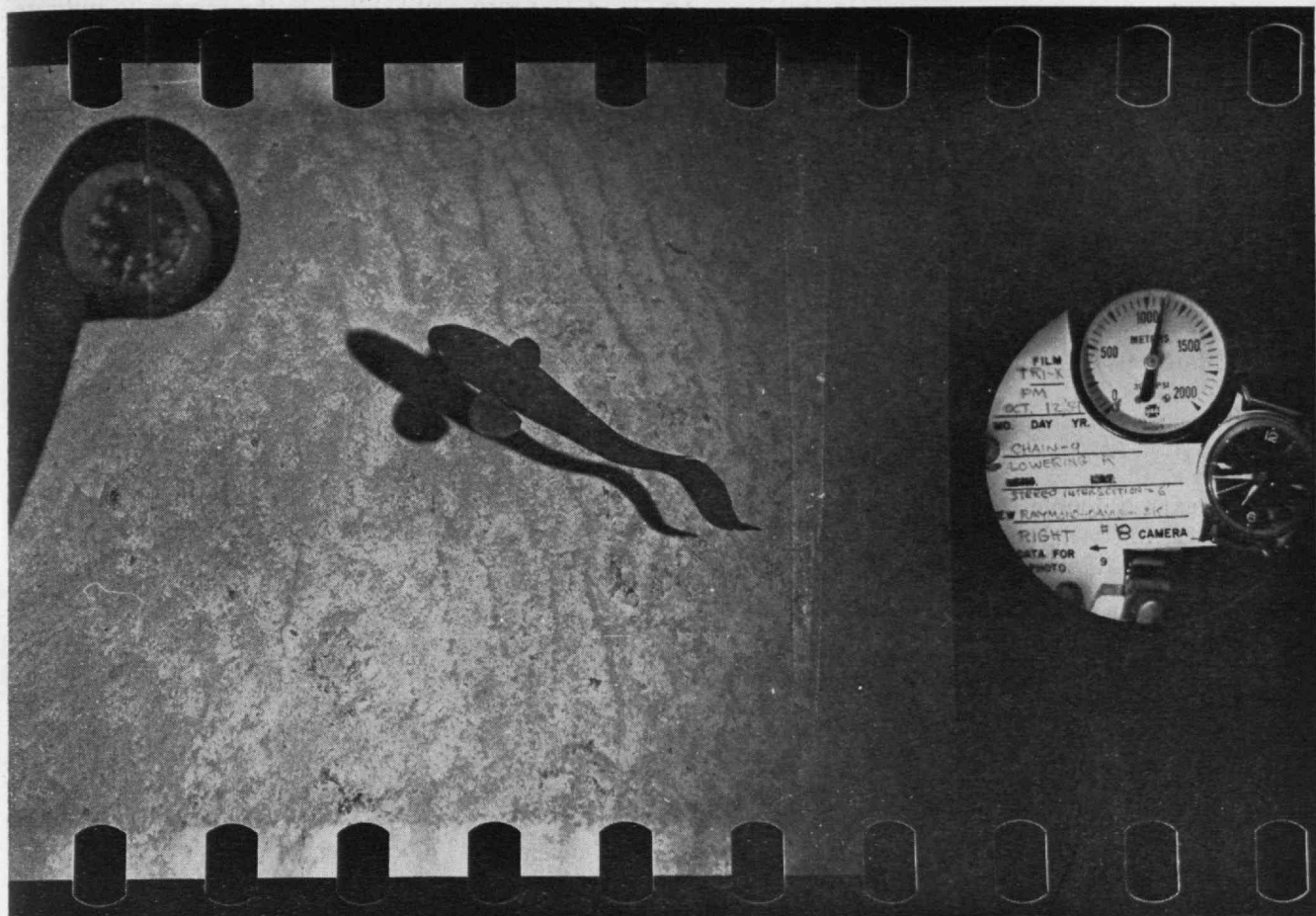
Bathyscaphes, however, have operational difficulties, especially in the open ocean far from an operating harbor and base. Even in the relatively quiet Mediterranean, one must pick the good days to dive, and these are often far apart. It would be difficult to work far from a base at some of the great depths of the ocean.

#### *More Photography Needed*

Every time I go on a cruise, I am impressed by the small amount of actual time a research ship is "on station." Most of the time is spent going and coming. Possibly some day a large barge will be anchored at sea for a long time so that extensive experiments can be made, including photography, coring, and dredging, to yield a coherent picture of a particular area under study.

Our automatic cameras hanging on a wire or line can take a great many photos from the deck of practically any ship. We could be considered to be in competition with the bathyscaphes, but are really collaborating on the main problem of exploration. I personally favor a lot of preliminary activity with automatic cameras so a bathyscaphe observer will have the benefit of a photographic preview before he goes down. The effort required to lower a camera is small compared to that necessary for a bathyscaphe dive.

Automatically operating underwater cameras can follow several systems. One of the first methods of bottom photography was the "pogo stick" method. The camera and light are mounted on a vertical stick which has an electrical switch on the bottom. When this strikes the bottom, the photo is taken. Then the camera either is raised to the surface or pulled up a few feet and relowered for another flash. A sonar is sometimes used to give a "ping" when the photo is made. Otherwise the operator might not know at the surface that his camera had reached the bottom, because his steel lowering cable's weight becomes very pronounced at great depths. Professor Edward Thorndike of Queen's University uses the "pogo stick" method in the designs he makes for Professor Ewing of the Columbia Lamont Laboratory.



With sponsorship of the research committee of the National Geographic Society, I have had the opportunity to assist Commandant Jacques Y. Cousteau on his ship *Calypso* in his efforts to study the ocean by means of photography. Cruises in 1953, 1954, and 1955 were made in the Mediterranean; in 1956, in the Atlantic at the Romanche Trench; in 1958, off Monaco, and in 1959 off Puerto Rico, Guadeloupe, and Martinique. After each of these cruises I returned to M.I.T. with a list of the difficulties with the photo equipment and a list of the desired characteristics. There are still many limitations to the underwater photography equipment, but I feel that considerable improvement has been made. Before long, I hope, standardized underwater models will be in use in all the oceans, gathering and disseminating information to everyone.

One of these days a research ship will go to sea with photography as its high priority objective. Up to now, photography usually has had low priority on oceanographic expeditions. I know, in fact, of several expeditions that did not take

cameras because of the added expense, which was microscopic compared to the cost of operating the ship and the expedition.

We seldom stop to think of the advantages of photographic recording since the technique is so commonplace. For example, how many bits of information can be stored on an ordinary 35-mm. negative? With only 20 lines per mm. resolution we can put down half a million facts on a single 1½-by-1 inch film. Few other media of recording information can match this.

#### *Electronic Flash Lighting*

My first recallable experience with underwater photography was helping Dr. Newton Harvey with a camera to photograph deep-sea fishes about 10 years ago. The new (at that time) electronic flash system of lighting offered a design which could take many photographs per lowering, as compared to the single-shot expendable flash bulb. Harvey's results were not up to his expectations. This conclusion still applies to most of the work today, although there is a bright spot once in a while. Tremendous numbers of photos are re-

quired to get one good one when the shooting is at random.

The electronic flash system has the following characteristics: (1) Many flashes can be obtained from a lamp. (2) Conversion of electrical energy to light is efficient. (3) The color of light resembles daylight. (4) Control of the quantity of light per flash is possible. (5) The instant of starting can be controlled accurately. Most of these advantages are utilized in underwater photography, especially the first.

My chief interest in photography has been in the development of electronic flash lighting equipment. Since Dr. Harvey's visit, I have made more than a dozen underwater cameras with flash attachments. In this work it has been necessary to develop special cameras with specifications that are particularly useful in casings that must withstand tremendous hydraulic pressures. I have had the co-operation of many people, especially that of Lloyd Hoadley of Woods Hole Oceanographic Institution on the casing designs, and Dave Owen on applications.

The "free floating" camera sometimes used is built to return to

the surface by its own buoyancy after reaching the bottom and taking a single photograph. If the camera is not found, one always wonders if it became stuck down there or just got lost.

Another design is the "continuously running" camera, which cycles at a known rate, thus exposing photos above the bottom and at different levels. One design, as used for several years, takes photos at 12-second intervals for about three hours, while 100 feet of film goes through the camera. There are 800 pictures in this length. New thin base "Cronar" film may enable the camera to expose double this normal number in one loading. A clock-driven switch also is incorporated in the design to introduce a delay of up to two hours, and thus prevent the camera from starting until it is near the bottom.

#### *"Dynamic" Photography*

It occurred to Cousteau and the author, after carefully examining thousands of midwater photos in and near the scattering layer, that a fast-moving camera is needed to surprise the mobile creatures that inhabit the depths. We think that a camera hanging from a stationary ship finds itself in a sphere of water devoid of animals except those that have no capability of flight, such as medusae, siphonophores, etc. Very rarely, if ever, have we obtained photos of shrimp, squids, etc., the animals which can flee from the flashes.

In August and September of 1958, while off Monaco, Cousteau and Alimat devised a paravane or drag on the bottom of a camera to hold it down while the ship was under way. A few tests were made which showed encouraging results, such as a hundred shrimp on a dozen concurrent photos. A depth-recording system consisting of a pressure gauge that was photographed on the film was necessary to show the actual depth at which the photographs were made. It is my firm conviction that this fast-moving camera with a data-recording section will prove to be a useful tool.

Cousteau also has devised an underwater sled to carry cameras on the bottom of the sea. Both still cameras and 16-mm. motion picture cameras have been used, with black-and-white and color film. A fast recharging 5 watt-second electronic flash was used with the motion picture camera at 20 flashes a second during the summer of 1958 off Nice and Monaco. The flashes were synchronized to occur when the camera shutter was open. The results were very exciting to us.

More motion pictures were made with an oil-cooled, 20-watt-second unit that operated at 24 frames per second during the cruise of the *Calypso* to America and back.

#### *Data Cannot Be Lost*

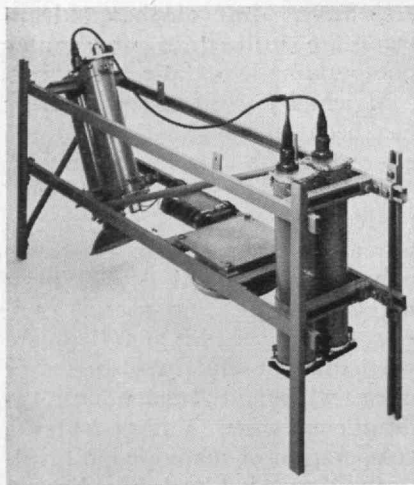
The latest model of camera, which is now being designed for a Woods Hole Oceanographic Institution project, will have a data-recording

chamber in the camera to indicate on the film the depth (pressure), time (photo of a watch), and a data card with position, date, etc. This type of data becomes of greater importance as the number of films is increased, since it reduces the danger that films will be mislabeled or data lost. If the data are on the film, they will always be there.

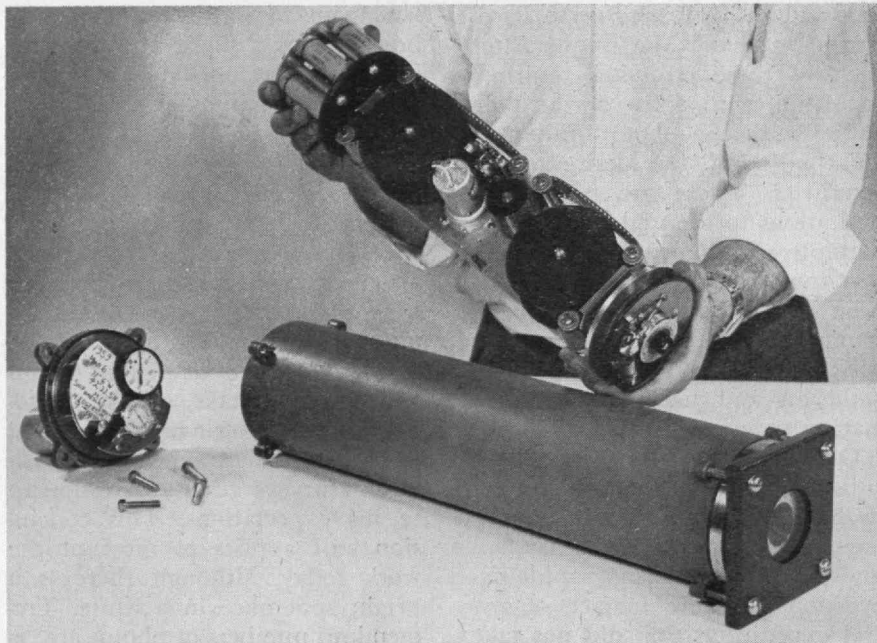
A sonar on the camera will indicate to the observer on the ship when a "sound scatterer" is in the axis of the camera. He then can push the button to take a photograph which will help him find out what is there. An effort is being made also to trip the camera automatically when a "subject" is in the field of the camera.

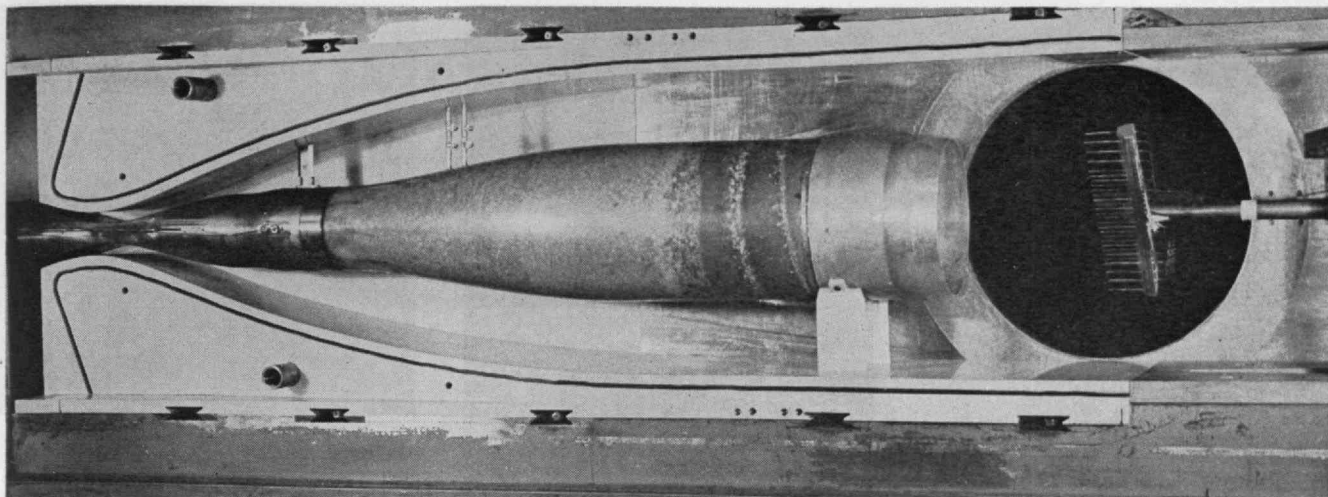
A lens especially designed by Professor Robert Hopkins of the Optics Department of the University of Rochester should give us additional information by producing a clearer wide-angle photograph. Distortions are experienced when a lens as used in air is used for underwater photography. The new lens is corrected for photography through the window and the water.

Libraries of photographs of the bottom of the oceans are needed. Several such collections have been started; for example, Dr. R. B. Hersey has several fine books with photos of the Blake Plateau which are available to all to study. I am sure that exchanges of photographs will be commonplace in the future among the world's research centers.



In frame above, strobe is at left, sonar pinger in center, and stereo cameras at right. Large picture shows a new camera removed from its case.





The new aluminum nozzle is inside of the wooden nozzle: 10,000 horsepower is used to push air through opening at left.

## From Supersonic To Hypersonic

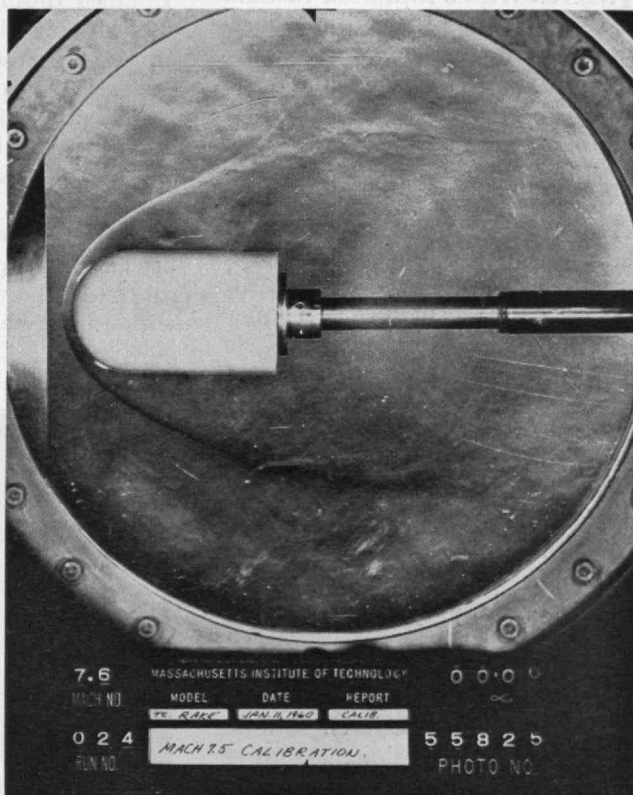
THE VELOCITIES attained in the Naval Supersonic Laboratory wind tunnel on Audrey Street, at the western end of the M.I.T. campus, have been about doubled. Briefly stated, this was done by placing a hypersonic tunnel inside of the original supersonic tunnel. Credit for this economical, technical advance is given by John R. Markham, '18, Professor of Aeronautical Engineering and Director of the Laboratory, to two of its senior scientists, Eugene S. Rubin, '45, and Jacques A. F. Hill, '47.

The necessary modifications cost only about \$150,000. In other wind tunnels, where brute force is relied on, millions of dollars have been spent to attain the velocities that are now produceable in this tunnel. This is believed to be the first time that a wind tunnel in the United States has been modified in this way.

Although the laboratory currently is using air at only 100 pounds pressure and 1000 degrees F., velocities of more than Mach 7 (about 3,000 miles an hour at ground level) have been reached. Higher temperatures and pressures are expected to increase velocities to Mach 15 (more than 11,000 miles an hour), and electrical and magnetic means of ultimately attaining still higher velocities are being studied.

In all hypersonic wind tunnels, the air is heated to prevent it from turning to liquid as it passes through the nozzle. Like traffic speeding up after passing a bottleneck, the air goes faster and spreads out after it leaves the nozzle throat. Judicious design of the nozzle and control of the flows were necessary to reach higher velocities without increasing power requirements and heating problems.

The nozzle of the new hypersonic tunnel looks like a giant cigar holder. It is an aluminum casting (made by the Gorham Manufacturing Company of Providence) about five feet long and a foot in diameter, mounted inside of the 18 by 24-inch section of the supersonic tunnel. The hypersonic nozzle's interior is



Schlieren photo shows shock waves from model in tunnel.

smooth and accurate to within thousandths of an inch.

A relatively small amount of high-pressure, heated air is fed to the hypersonic tunnel from an independent source. This air in the inner tunnel then responds to the lower pressure in the outer section and accelerates its own flow in an effort to fill this void. The outer supersonic stream continues and serves as an insulating blanket around this central hypersonic core.

The Naval Supersonic Laboratory is operated for the Navy by M.I.T.'s Department of Aeronautics and Astronautics. Many of the weapons now being adopted were tested in it, and it has become the principal experimental and research center for undergraduate and graduate students interested in problems of aerodynamics and aerodynamic heating.

# A New Way To Make a Vacuum Tube

**I**NEXPENSIVE, do-it-yourself vacuum tubes that can be used in laboratory experiments, and incidentally in simple radio sets, are being made this year by M.I.T. students as part of the program to modernize the teaching of high school physics.

Jerrold R. Zacharias, Professor of Physics and the guiding spirit of Educational Services Inc., which is producing new books and films for the high schools, has called the new method of making the tubes "a major breakthrough in vacuum technique," and expects it to have a revolutionary effect on physics instruction.

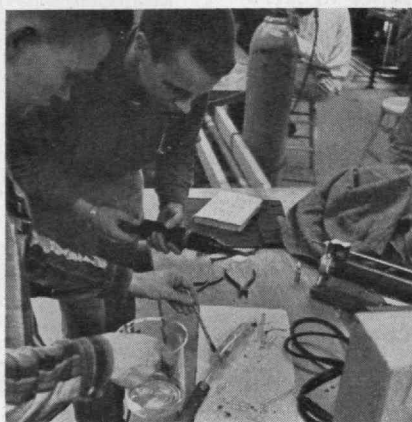
Modern physics is based largely on experiments requiring vacuum tubes, but making them by standard techniques requires both expensive equipment and highly skilled technicians.

This new method was worked out by J. H. Owen Harries, who heads a consulting and research firm in Bermuda, and has done extensive work on vacuum tubes, radar, and related problems. Pilot kits of parts are being tried out in colleges throughout the United States. The present kit sells for \$50 and makes possible the construction of between 10 and 20 tubes. The choice of a triode as the first project was simply to test the technique; some 40 experiments are planned relating to a wide range of physical phenomena. An instruction manual will be cross-referenced to textbooks.

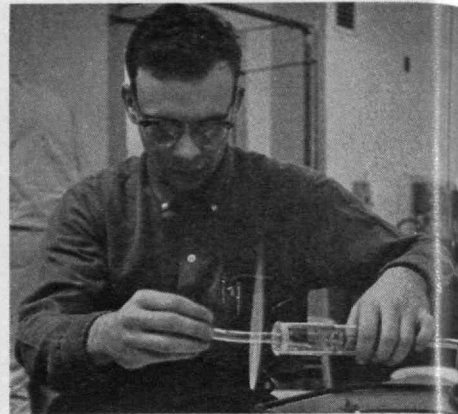
Applications of the technique in industry, and its possible uses in research work as well as in education are to be studied, too.—  
WILLIAM T. STRUBLE.



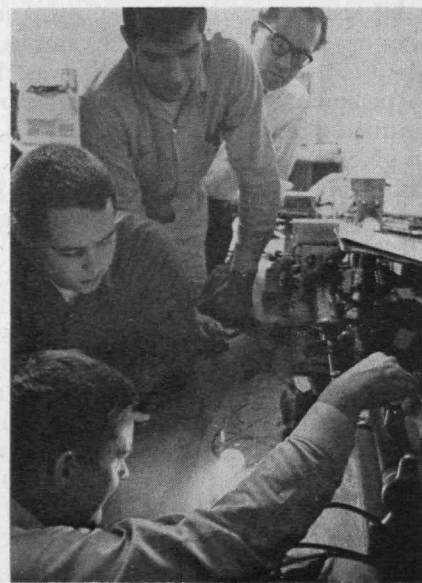
**1** Glass tubing and commercially available glass stems which are already wired are joined with glass solder. The solder is fused at a temperature of 520 degrees C. in inexpensive, table-top ovens. These are made of sheet asbestos, fiberglass, Transite, and aluminum foil, and sit on asbestos-covered firebrick. The student above holds a soldered tube which was assembled without the help of a glass blower.



**3** Is the tube vacuum-tight? This is a crucial step. If there is a leak the tube-makers may have to do some patching. For this test, the tube is hooked to a hose from a vacuum pump. A solution of acetone is put around the soldered joints by one student while another holds a tester coil. When there is a leak, the acetone shows in the interior of the tube as a blue-green glow. These trials of the technique were made in the M.I.T. sophomore physics laboratory under the supervision of John G. King, '50, Associate Professor of Physics.



**2** The next step is to seal off the tube at one end over a gas flame. Metal electrodes inside the tube have been clamped together, which eliminates the need for welding. A pair of pliers and a screwdriver replace the welding equipment. Chemical "getters" which will be used to achieve a high vacuum in the final stages of student tube-making already are inside the tube.



**4** This is the final phase of obtaining a good vacuum. Barium, aluminum, and titanium are evaporated in the tube. Professor King (foreground) is shown increasing the current through heating wires already sealed into the tube, which gives off a glow as the chemicals evaporate. When this step is finished, the tube has a mirror-like coating on the inside of the glass envelope. The equipment and skills required when this simplified process of tube-making is followed are within reach of most schools and students.

# BUSINESS IN MOTION

## *To our Colleagues in American Business ...*

Wham! And the fisherman hooks another record-breaker on the lure you see below. Just as that smart angler knew how to successfully fish that "Pet" Spoon bait so did the maker who designed and perfected it know exactly where to go in search of the brass from which to make that lure.

In order to produce the finest quality bait at a competitive price, he knew that he required a metal that could be easily stamped and formed, and of such quality and uniformity of grain structure that only the minimum of finishing would be required prior to the chromium plating of the lure.

Past experience had proved to this artificial bait manufacturer that, of the various commercial metals available, brass was the metal to use for this lure. For brass is easily stamped and formed . . . has just the right "heft" for casting, does not rust and it takes chromium plating as a fish takes to water. But when it came to selecting the exact type of brass that would best fit his exacting requirements, he called on Revere.

The result was a Revere Brass with special grain

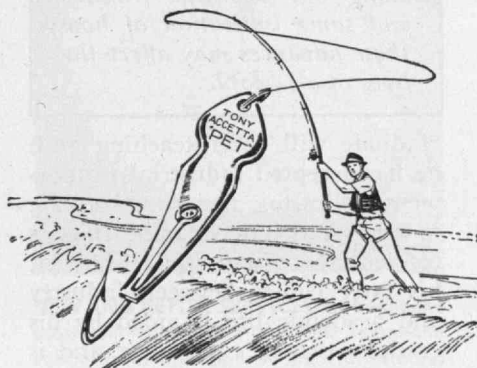
size and finish, and just the right ductility so that even after stamping and forming only a minimum of work is required prior to chromium plating.

Said the manufacturer, "Without a doubt, the fine quality of Revere Brass has contributed immeasurably to the quality of our baits, at the same time saving us money on forming and finishing cost. In fact, it is the quality of the material, plus design

and workmanship that has made it possible for us to be awarded the Medal of Honor by the Sportsman's Club of America for the superiority of design and fish-getting ability of our baits, as well as the National Sportsman's Research Award, which is

a real tribute to the design, workmanship and effectiveness of our lures."

The experience of this manufacturer, once more illustrates how, only by working closely with your supplier are you able to realize the highest return per dollar spent. That, too, is why it may very well pay you to let Revere help you "fit the metal to the job." Others have profited by this service, why don't you take advantage of it?



**REVERE COPPER AND BRASS INCORPORATED**

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## Engineering Education

(Concluded from page 29)

facilities, and most important, in faculty for engineering schools. Each of these problems is really serious. They can be solved only if as a nation we place a sufficiently high value on education to generate the major effort, and the will, to solve them. There is a certain time element, however, that makes the faculty problem especially serious. Given a sufficient sense of urgency, money and facilities can be provided in a relatively short time. Faculty, however, require time for growth and development, and hence needs must be anticipated over a long time.

The faculty recruitment problem in engineering colleges is augmented by the intrinsic nature of engineering and of its appeal to young people. One goes into engineering because he likes to build things, to see structures, machines, processes, and products developed and produced by utilizing skillful applications of science. The natural expectation for the new bachelor of science in engineering is therefore to seek a job where these things are being done, primarily in industry. Even graduate work often is not seriously considered, especially by a senior in a school that stresses primarily undergraduate work, and whose bachelor product tends to follow a pattern of employment in industry. The possibility of a career in engineering teaching rarely enters the mind of the engineering senior unless through some special opportunity he has assisted a professor in his teaching. Most of our present teachers entered teaching by the back door when called upon to do some teaching as a means of earning money to continue in graduate school. Thus it was almost by accident that they discovered the attractions of the life and activities of a teacher.

The Committee on the Development of Engineering Faculties of the American Society of Engineering Education stresses that the really critical element in solving our engineering faculty problem is the choice made by the well-qualified engineering senior between immediate employment and residential graduate work. Statistically the probability that an engineering

### M.I.T. on TV

*A SERIES of one-hour television programs in recognition of the centennial of M.I.T. will be presented on the CBS Television Network during the 1960-1961 season. Each program will feature a currently important area of science.*

*The American Machine & Foundry Company will sponsor these "Tomorrow" programs and they are to be presented in prime evening time.*

*In announcing the series, President Julius A. Stratton, '23, of M.I.T. said: "We at M.I.T. welcome this opportunity to join forces with the CBS Television Network in bringing to the attention of the American public both the fascinating and significant advances currently being made along our scientific frontier and some indication of how these advances may affect the lives of all people."*

graduate will enter teaching once he has accepted industrial employment following the baccalaureate is very small indeed. If he chooses residential graduate study, however, his later choice between industry and academic life is aided by his graduate school experience, and is still made without prejudice, since graduate work enhances his value for either field. Once the faculty in the graduate school gets the opportunity to see and work with the well-qualified student, the way is open to explore, through discussions and actual experience, his potential and interests for academic work as well as for industry.<sup>2</sup>

Central to the solution of this faculty problem is an adequate salary structure. Too many faculty

<sup>2</sup>The Committee on the Development of Engineering Faculties last year published a little booklet, *Teaching Tomorrow's Engineers*, which is achieving rather wide circulation. It tries to help the engineering senior think about whether teaching might possibly be of interest to him, and whether his aptitudes and interests are such that he should in any case seriously consider graduate work, thus keeping the way open to a possible teaching career. It is available on request, without charge, from W. Leighton Collins, Secretary, A.S.E.E., University of Illinois, Urbana, Ill.

salaries today are not, for example, adequate to give faculty children as good educational opportunities as their parents enjoyed. We have reason to believe, however, that the better academic salary scales available today are not entirely unsuccessful in attracting and holding some good people, and that the ultimate potential for recruits to teaching among today's engineering seniors has been only modestly explored. We get encouraging reports that many students can be interested in the intangible attractions of a vigorous scholarly life in a university environment by friendly chats with a respected professor. Not all of our young people today appear to be the crass materialists that some would have us believe. They appear quite competent, given honest and articulate counsel, to place dollars and other values in valid personal perspective.

### Our Vital Need

I emphasize faculty because faculty are the *sine qua non* of an engineering school, as of any element of a university. Students will face the demands of tomorrow's or any, new technology without a qualm if they are guided and inspired by faculty who themselves understand new fields. The student doesn't recognize a new field as being difficult unless so taught by his professor. If the professor sees a new field as something that offers excitement, the opportunity for absorbing new work, and for helping to solve some of the current problems, and if the professor has real insight and understanding in these matters, his students will share these outlooks and attitudes. They will master the necessary disciplines with surprising unawareness that some years ago these areas would have been regarded as frightfully advanced and difficult.

Our vital need, therefore, for meeting the problems that face us in engineering in the future is for adequate numbers of really first-rate faculty in our engineering schools. If we can attract such faculty and back them with adequate support, both material and moral, we need have no fear but that engineering programs will evolve in a continuing process that is responsive to the ever-growing demands of our new technologies.

# **Good Telephone Service and Good Telephone Earnings Go Hand in Hand**

**There is no way to have one without the other**

**T**he function of the Bell System is to serve you and serve you well.

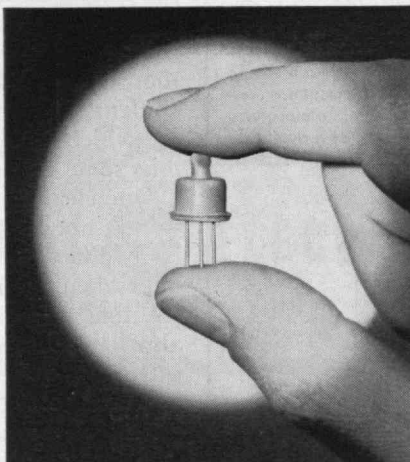
It works two ways.

We must serve well to prosper.  
And just as surely we must prosper  
to serve you well.

Progress does not just happen. It has to be encouraged and made worth while. And it costs money; in the telephone business a whole lot of money.

Sheer prudence would bring a hesitancy to go full steam ahead if there are too many restrictions on profits. Or if the rewards of efficiency, good research, good management and downright hard work are sliced away as soon as earned.

In the telephone business there is special need for a sustained level of adequate profits. For the telephone business, more than almost any other, is a long-term business. Al-



**NEW AND BETTER SERVICES** for telephone users will come from the Bell Telephone Laboratories invention of the Transistor, a major scientific breakthrough. This mighty mite of electronics, which can amplify electric signals up to 100,000 times, will play a big part in push-button telephony, for example. The Transistor has been made possible by basic physical research that can only be undertaken by a progressive business with good earnings over the long pull.

ways we must keep building ahead to meet the needs of tomorrow.

These needs are growing every day. Just the gain in population alone gives some idea of their size.

By 1970—just ten years away—there will be 40,000,000 more people

in the United States. More and more communication services will be required by people, industry and defense.

So when we emphasize the need for satisfactory earnings on a continuing basis, it is for a very practical and useful purpose. It helps us, of course. But in a very real sense it helps you.

Only with adequate profits can we run the business most efficiently and take advantage of long-range economies.

Only with adequate profits can we finance and put in operation the latest advances in telephone science.

All this not only improves the service but helps to hold down the cost of providing it.

The result over the long run is bound to be better service for you at a lower price than you would otherwise have to pay.

**BELL TELEPHONE SYSTEM**

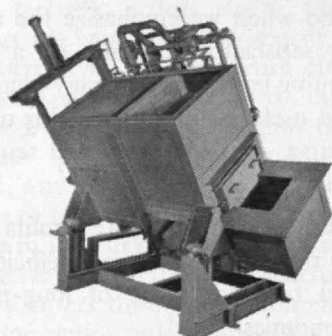
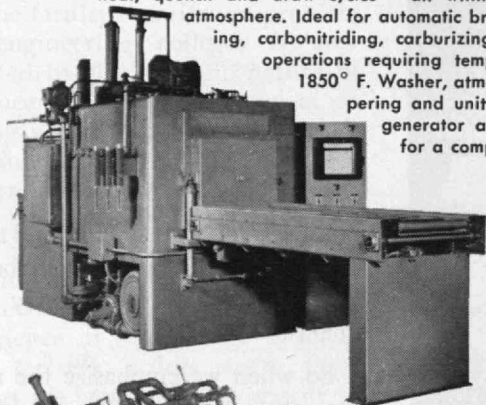


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## Why Do Good Men Fail

(Concluded from page 32)

70 per cent of our entering students complete their programs on time and only 7 or 8 per cent fail during the first year. Of these, a significant portion of those who withdraw for other work are convinced that M.I.T. was a happy and valuable experience. In the balance, too, are the freshmen who carry a full academic load (sometimes an overload), do well in all their subjects, and take an active part in campus life.

There is no doubt that many students who are ultimately successful have encountered some of these problems on the way. This is one reason why we cannot abandon our failing students with a simple explanation such as "poor preparation" or "laziness." Nor do I think that anyone would agree that we should shelter all of our children to the extent that none of them ever would have to encounter these problems. Education for creative living and the retention of the status of baby from cradle to grave are incompatible concepts. It is not at all clear to me that we should avoid the risks inherent in having students who might fail — even if we could tell which are which. We would, in the present state of the art, miss some real stars, too.

One clear impression gained from this work is that we are not skillful enough to tell which students will have difficulty. Most frequently, we spot the wrong ones when we try to do this before the student arrives. (By that time, in addition to the admissions data, we also have a specially solicited letter from the parents introducing the boy to us.) But it is possible to find an admissions folder of a boy on the Dean's List which reads just like that of a boy in difficulty. There are simply some things about any person that are different after he has lived another year, especially if there has been a big change in his physical, mental, and spiritual environment.

As Educational Counselors and Admissions Officers, we should strive to be sure that the student knows as clearly as can be known what he is planning to do. This is guidance. We should present him with a factual picture of college, of M.I.T., and of professional life. We should use every means at our disposal to see that he knows the meaning of the words he uses — science, engineering, humanities, that he has opportunities to test his aptitudes and skills rigorously, that his motivation is relatively strong, and that he realizes that, however we like to pretend, we adults do share our burdens with those who want to help us.

If we can do these things, recognizing that however well we do we are capable only of increasing the probability of success toward the maximum, but never to it, we can make a real contribution to the young people who decide to come to M.I.T.

## Music at M.I.T. in March

CONCERTS scheduled in Kresge Auditorium include: March 8, 8:30 P.M., André Marchal; March 12, 8:30 P.M., All Tech Sing; March 13, 3 P.M., Juilliard Quartet; March 18, 8:30 P.M., M.I.T. and Pembroke College Glee Clubs; and March 20, 3 P.M., M.I.T. Choral Society.

# a challenge

## to Nuclear Engineers, Physicists, Metallurgists

Openings are immediately available for Nuclear Engineers, Physicists and Metallurgists interested in applied research, development or design of novel reactors at The Knolls Atomic Power Laboratory. The broad aim of these endeavors is to achieve a new regime of simplification in reactor technology.

Address your inquiry to Mr. A. J. Scipione, Dept. AL.

**Masters Degree Program.** KAPL is now considering recent graduates in ME, Met, Met E, ChE, Physics, EE, Nuclear E. and Marine E. for its masters degree program in nuclear engineering in conjunction with Rensselaer Polytechnic Institute. Applicants should have strong interest in nuclear field and must have graduated in upper 10% of their class. Selection of candidates will be completed by April 1; classes begin September, 1960. Write for further details.



*Knolls Atomic Power Laboratory*  
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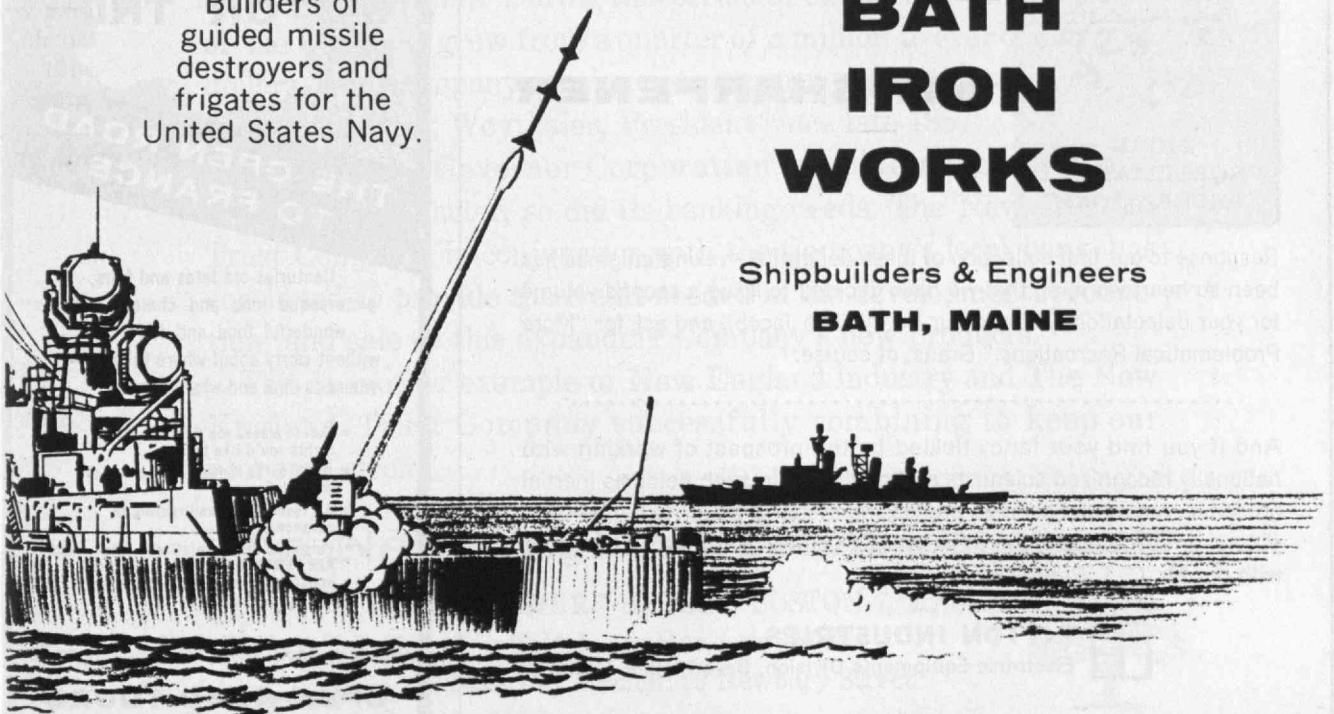
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## **BATH IRON WORKS**

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## Individuals Noteworthy

(Continued from page 12)

### New Posts

NAMED in the news recently were the Alumni and members of the Faculty whose elections, promotions, and appointments are recorded below:

*Raymond H. Blanchard*, '17, as President, Associated Industries of Massachusetts . . . *John J. Healy, Jr.*, '21, as Vice-president, American Institute of Chemical Engineers . . . *Dana C. Huntington*, '21, as a Director, Framingham National Bank . . . *Henri P. Junod*, '21, as President, American Coal Sales Association;

*Alfred E. Perlman*, '23, as a Director, Alleghany Corporation . . . *Paul J. Cardinal*, '24, as Treasurer, National Vitamin Foundation, Inc. . . . *George J. Taylor*, '26, as Vice-president in charge of Research, Development and Marketing, Day-Brite Lighting, Inc., St. Louis;

*William Wraith, Jr.*, '26, and *Thomas K. Graham*, '35, respectively, as Assistant Vice-president and as Metallurgical Manager, Ana-

conda Company . . . *Clarence L. A. Wynd*, '27, as General Manager, Kodak Park Works, Eastman Kodak Company;

*Walter F. Burke*, '29, and *Ben G. Bromberg*, '47, as Vice-presidents, McDonnell Aircraft Corporation, St. Louis . . . *Clarence M. Chase, Jr.*, '32, as Assistant to the Treasurer, Union Carbide Corporation . . . *William G. Ball, Jr.*, '34, as Assistant Director of Public Relations, Ethyl Corporation;

*William F. Bode*, '36, as Vice-president and General Manager, Selig Company, Atlanta, Ga. . . . *Charles R. Holman*, '36, as Plant Manager, Pittsburgh Plate Glass Company, Springdale, Pa. . . . *James McCormack*, '37, as a Director, State Street Bank and Trust Company, Boston;

*James D. McLean*, '37, as President, Stromberg-Carlson Division, General Dynamics Corporation . . . *Thacher H. Fisk*, '39, as General Counsel, Kendall Company . . . *James E. Seebold*, '39, as Co-ordinator, Process and Engineering Development, Standard Oil Company of Indiana;

*Thomas F. Malone*, '46, and

*James M. Austin*, '41, respectively as President and Secretary, American Meteorological Society . . . *Newman M. Marsilius, Jr.*, '42, as President, Chamber of Commerce, Bridgeport, Conn.;

*Charles A. Hathaway*, '43, as Assistant General Manager, Air Impeller Division, Torrington Manufacturing Company, Torrington, Conn. . . . *Robert V. Bartz*, '44, as Executive Director, Associated Rocky Mountain Universities, Inc. . . . *Edmond G. Dyett, Jr.*, '47, as President, National Noise Abatement Council;

*Peter P. Poulos*, '47, as Scientific Director, Heart Institute of United Hospitals, Newark . . . *William B. S. Leong*, '48, as Planning Director, Haverhill, Mass. . . . *John J. Glover*, '49, as Chairman, Division of Chemical Marketing and Economics, American Chemical Society.

### Honors

MEDALISTS and recent recipients of other awards include:

*Augustus B. Kinzel*, '21, the James Douglas Gold Medal, by the American Institute of Mining, Met-  
(Concluded on page 48)



### WIT-SHARPENER

Response to our first collection of these delightfully vexing enigmas has been so heart-warming that we have decided to issue a second volume for your delectation. Write to our Dr. William Jacobi, and ask for "More Problematical Recreations." Gratis, of course.

And if you find your fancy tickled by the prospect of working with nationally recognized scientists and engineers in such fields as inertial guidance, radar, tactical data processing systems, airborne digital computers, or space research investigations, you will want to communicate with our Mr. C. T. Petrie.



**LITTON INDUSTRIES**

Electronic Equipments Division, Beverly Hills, California

### A NEW KIND OF MOTOR TRIP!

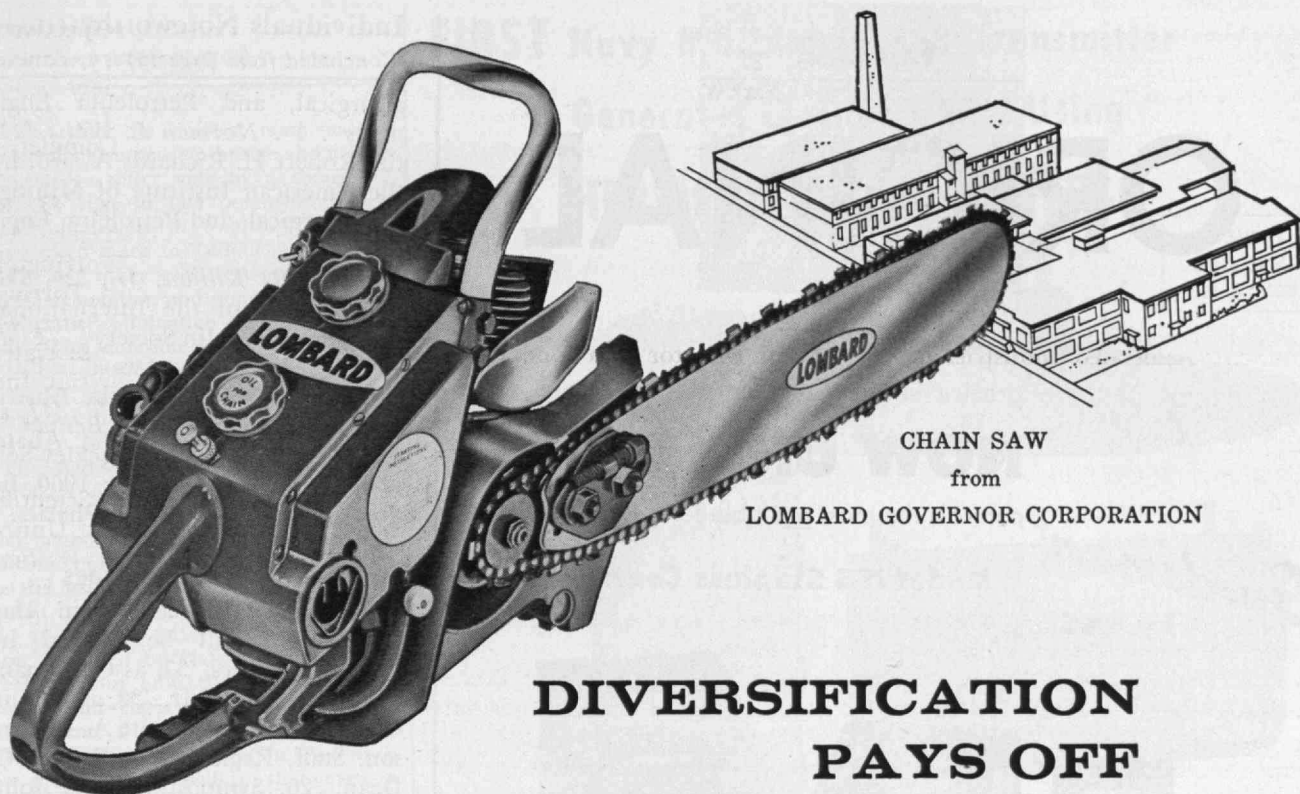
### THE OPEN ROAD TO FRANCE

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picturesque inns and chalets,  
wonderful food and fun . . .  
without worry about where to stay—  
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## DIVERSIFICATION PAYS OFF

When Lombard Governor Corporation of Ashland started banking with The New England Trust Company in 1946, it manufactured a narrow line of products. Though the Corporation was successful, the late Henry E. Warren, owner and President, felt that a broader base of operations was desirable.

Between 1946 and 1956, Mr. Warren successfully expanded and diversified the Company's products to include the manufacture of power chain saws and plastic molding machines, in addition to hydraulic governors. During this period of expansion, the net worth of the Company grew from a quarter of a million to over one million dollars. The Company continues to prosper under the able leadership of Mr. Max Woythaler, President since late 1957.

As Lombard Governor Corporation's business increased and changed in character, so did its banking needs. The New England Trust Company, in conjunction with the Company's local bank, has continued to provide the credit needed in the development, production, and sale of this expanding Company's new products.

This is another example of New England industry and The New England Trust Company successfully combining to keep our economy strong.

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1952

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# ORIGINAL

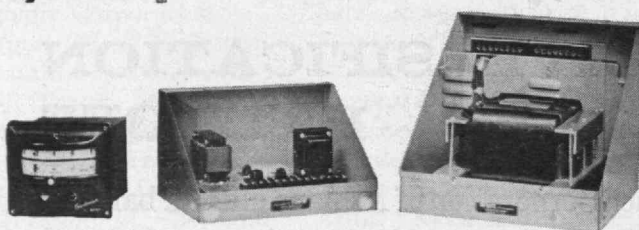
instrumentation for most  
precise temperature control

## NOW UNIVERSAL:

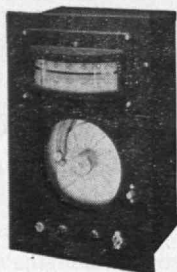
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The most compact programming system available includes Model JSBG (left) for any operation involving a time-temperature cycle. Its simply cut cams integrate and control time with temperature.

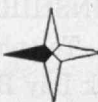
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the trend is to WEST



## Individuals Noteworthy

(Concluded from page 46)

allurgical, and Petroleum Engineers . . . *Norman L. Weiss*, '23, the Robert H. Richards Award, by the American Institute of Mining, Metallurgical, and Petroleum Engineers;

*James R. Killian, Jr.*, '26, the Gold Medal of the International Benjamin Franklin Society . . . *Elias J. Corey, Jr.*, '48, the Award in Pure Chemistry for 1960, by the American Chemical Society . . . *Benjamin Lax*, '49, the Oliver E. Buckley Solid-State Physics Prize for 1960, by the American Institute of Physics.

## Alumni Day Committees

THE 1960 M.I.T. Alumni Day Committees will be headed by Philip H. Peters, '37, as Chairman; Albert O. Wilson, Jr., '38, as Deputy Chairman; and Wolcott A. Hokanson, Staff, Registration; Robert C. Dean, '26, Symposium; and John L. Danforth, '40, Luncheon. Mr. Wilson will also head the Committee on the Banquet and Evening Entertainment. Subcommittee members will be:

Registration — G. Edward Nealand, '32, and Robert E. Hewes, '43.

Symposium — Gregory Smith, '30, Jay Zeamer, Jr., '40, Gerald V. Quinnan, '45, Arthur L. Bryant, '44, and Irwin W. Sizer, Faculty.

Luncheon — William H. Carlisle, Jr., '28, Vincent T. Estabrook, '36, David P. Flood, '45, Mrs. Nathaniel McL. Sage, '13, Philip A. Stoddard, '40, and Aaron M. White, '39.

Banquet and Evening Entertainment — Harold Bugbee, '20, Cason Rucker, '35, Edward R. Marden, '41, Edwin H. Tebbetts, '46, Arnold S. Judson, '47, Miles P. Cowen, Staff, William Morrison, Staff, Lloyd deW. Brace, Jr., '56, and Mrs. John W. Sheetz, 3d.

## Local Activities

A COMMITTEE headed by Dr. Egon E. Kattwinkel, '23, has been authorized by the Alumni Council to review and recommend long-range plans for the Association's activities, especially in the area in and around Cambridge and Boston.

Its members are John A. Lunn, '17, Hugh S. Ferguson, '23, Carroll L. Wilson, '32, Clarence R. Westaway, '33, and James G. Kelso, Executive Assistant to the President.

the fact that the simplest mathematical models for a suspension bridge and a steel arch bridge differ only by a change of algebraic sign in one parameter which converts tensions to compressions. Descartes owed much to Rudolff (1525), Viete (1591) and other predecessors. Thus the Cartesian notation and point of view represents the culmination of a century of effort. This notation has proved of great technical convenience during three centuries of applications, and should not lightly be thrust aside, even as a temporary step in mathematical education.

The Madison Project group really goes overboard on the do-it-yourself idea, or in traditional terms, the Socratic method. This method is quite successful in college students' bull sessions, particularly if they are discussing a question like Free Will versus Determinism, for which answers and conclusions today differ little from those described by Plato more than 2300 years ago. But subjects like mathematics, physics, and engineering are cumulative in the sense that they do move forward from generation to generation. And it is too optimistic to believe that even a bright high school group, led by a well-informed and skillful teacher who can control the thought trend without seeming to, can construct a system and notation for algebra that took a genius like Descartes, profiting by the accumulating results of a long sequence of earlier mathematicians, to achieve.

In a recent statement from the M.I.T. Admissions Office about the plane geometry requirement, stress is put on the possibility of omitting some of the theorems from the traditional course, so as to make room for some topics from analytic geometry and solid geometry. This type of modernization has the complete sympathy of the writer if the following limitations are understood: To be as effective as the traditional course, sufficiently lengthy chains of theorems, each deduced from preceding theorems or assumptions, to give the student an idea of the structure of a mathematical science must be retained. And the majority of the theorems which are proved should be presented in the traditional complete form with steps and reasons. To be sure, there are a few lacunae in the reasoning of Euclid (c. 300 B.C.), such as that found by Pasch (1890) and rectified in the formulations of Hilbert (1901) and Veblen (1917). But to use these as an argument for completely ignoring Euclid's type of presentation is a serious mistake. The fact is that even our youngest professional scientists of today have been greatly affected by having, as their ideal of a logically presented argument, the Euclidean-type proofs of their high school geometry textbooks.

The writer thinks it even optimistic to expect reasonable efficiency in teaching graduate physics students the theory of functions by the raise-it-by-your-own-boots method, since it took, among others, Cauchy, Weierstrass, Goursat, and 150 years, for this field to reach its present

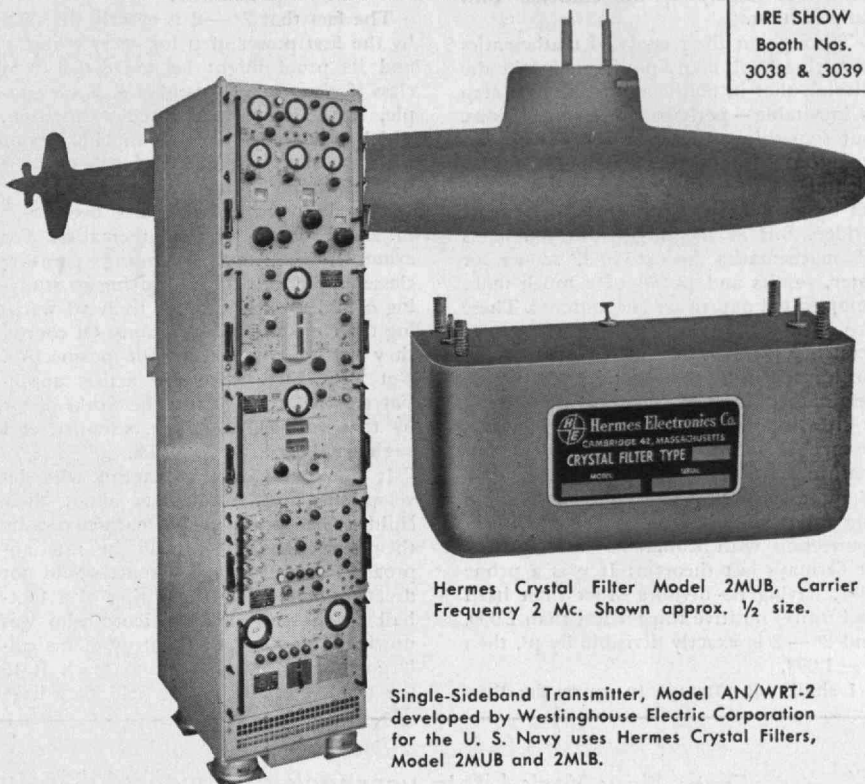
(Concluded on page 50)

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## Feedback

(Concluded from page 49)

development. But Professor Davis has many equally optimistic colleagues, who try to educe Boyle's law from General Education students at Harvard, and Newton's laws of motion from physics students at M.I.T. largely by the students' own rationation.

Throughout their study of mathematics in high school, many pupils maintain the illusion that in mathematics the next step is inevitable—perhaps not quite obvious, but something that they could have figured out for themselves with the same mental effort needed to solve a problem set by an expert in the game of contract bridge. But as the more advanced fields of mathematics are studied, sooner or later, results and proofs of a much more complicated nature are encountered. These are so involved that no one, starting from scratch, would be likely to develop them for himself in a single lifetime. Even their originators obtained them only by pushing a little beyond the results of their predecessors. To cite just one result which few mature mathematicians would care to attempt as an original exercise, I mention the following fact which was proved in connection with Kummer's investigations of Fermat's last theorem: If  $p$  is a prime (i.e., having no divisors other than itself and unity) positive integer less than 2,000, and  $2^p - 2$  is exactly divisible by  $p^2$ , then  $p = 1,093$ .

I shall not attempt to guess the time

that would be required for a group of M.I.T. freshmen who have elected to study Elementary Number Theory to deduce by themselves one part of the result just stated, namely that if  $p = 1,093$ , then  $2^p - 2$  is exactly divisible by  $p^2$ . But I can state that by using known methods of this field, I have often succeeded in presenting a proof of this to such a group of freshmen in 15 minutes.

The fact that  $2^p - 2$  is exactly divisible by the first power of  $p$  for every prime  $p$  and its proof might be re-created by a class if given a little guidance. For example, if the class were asked a question, which Euler asked himself in 1736, about the form of the expansion of  $2^p = (1 + 1)^p$  by the binomial theorem.

The do-it-yourself idea has been used in fields other than mathematics. For example, in some beginning painting classes the pupils do no copying or studying of older work in order to avoid warping their primitive inspirations. Of course, they also learn nothing of perspective. Not surprising, since few artists appreciated it before 1500 and the works of art by that versatile architect, scientist, and engineer, Leonardo da Vinci.

It is noteworthy that parents who develop enormous enthusiasm about their children's ability to evolve mathematics by themselves, have less faith in this approach elsewhere. Such parents would not dream of tolerating the hiring of a football coach with no experience who was unwilling to study the strategy of his colleagues and predecessors and teach it to the team. Perhaps in this field they have

a more immediate pressure for efficiency, the desire to win. This same failure of do-it-yourself is also evident to any serious devotee of the game of chess who has seen a number of mediocre players who remain wood-pushers largely because they are unwilling to profit by some study of master play.

Perhaps some of the writer's reservations about the novelty of educational experiments are due to his observations at M.I.T., where tolerance of the status quo is as rare as a calm ocean. A favorite remark of Professor Douglass' is that such experiments have a cycle of 10 or 12 years. Like the writer, he has now seen three full cycles.

May all teachers make full use of the dynamism generated in both students and teachers by the idea of participating in educational experiment and research. But let them remember that if you want a class to appreciate the language of a play by Shakespeare, it is more efficient to have them consult a library copy than to set 12 monkeys before typewriters, and wait until by chance the play is again written.

Department of Mathematics  
M.I.T., Cambridge, Mass.



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## When You Write a Report

(Continued from page 33)

Yet sometimes the reader inadvertently attaches undue weight to a statement simply because the writer was not careful in separating and labeling his primary and secondary evidence. Then, too, readers feel that the amount of space allotted to a topic has a direct connection with the importance of that topic. If a certain piece of secondary information contains so many details or qualifications as to require a large amount of text, the writer should summarize the information, relegating the details to an appendix. Descriptions of procedure often fall into this category, as do development of equations and discussions of test equipment.

Improper emphasis can, and frequently does, occur at the sentence level. Many of us think of grammar as a restriction rather than an aid to writing. So we fail to utilize an important tool that will assure a proper structure for our thought. The rule is: *Put main ideas in main (independent) grammatical constructions; secondary ideas, in secondary (dependent) grammatical constructions.* The writer who says, "The solution is best determined by field test and is 50 volts," has assigned equal weight to two ideas. Surely the statement of the value being 50 volts is the more significant, and a simple revision would so indicate: "The solution, best determined by field test, is 50 volts."

### 5. The need for separation of fact and opinion.

Naturally, every reader wishes to be able to distinguish between fact and opinion and between the views of the author and those of others. Thus every statement of opinion should be labeled and the person responsible for each identified. Plagiarism is not the issue. But since the pronoun "I" has been outlawed from many areas of technical writing, the author's personal views are frequently mistaken for those of accepted authorities in the field. Such common expressions as "It is believed that . . ." and "It is concluded that . . ." are cases in point. If personal opinion is not in order, then any way of expressing it is wrong. However, if the reader wants the author's views, then "I believe" is better than "The author believes," "It is the author's belief that," "It is believed that," or "We believe." For the formal company report, though, the author must say "The Engineering Department recommends," "BW&N believes," etc.

### 6. The need for precise, straightforward language.

For technical reports, the best style is one that does its work quietly in the background without calling attention to itself. The reader is after information, not an emotional experience. He asks for clarity and efficiency of expression, not impressive language. The major faults are illustrated below:

*Fuzzy words*—Plates of *appreciable* thickness. . . . A *relatively* high temperature. . . . A *small number* of failures.

*Euphemisms*—"A rapid structural failure occurred." . . . "Six tests were run and the firing curves were very smooth for all except the first, third, fourth, and sixth." (Both are from the Aerojet-General Style Manual.)

*Overformal words*—Conditions should *ameliorate* as

soon as the maintenance crews are *inculcated* in the theory of operation.

*Jargon and coined words* — The system can be introduced with *effectivity* within six months. . . . All the components are *ruggedized*.

*Clichés* — Last but not least, we intend, in the long run, to explore every avenue which might lead us to a solution along this line.

### Needs for a Rapid Understanding

Today every reader is in a hurry. He has so much to read that he has to skim nearly everything if he is to get through the daily pile of papers on his desk. He also has to read discontinuously, since the pressures of his job seldom permit him to read a report from cover to cover in one sitting.

From a practical viewpoint, the writer must cater to these needs. He must build ease of reading into his style and format. Actually the job is not so difficult as it is time-consuming. But this is justifiable, since the object is to cut down on reading time.

The following are suggestions for tailoring the prose and mechanics to the rapid reader:

1. *Use descriptive headings and subheadings freely.* They act as signposts, group related material, and show the interrelation of the parts and their contribution to the whole. Newspapers use headings, why not reports?

2. *Put the topic sentence at the beginning of a paragraph.* This gives the reader a choice. He can either read the details on the topic or skip to the next paragraph.

3. *Use a simple structure for a complex idea.* Whenever the thought is involved or otherwise difficult to describe, the grammatical structure should be simple. Three short sentences are easier to read in this case than one long one; a paragraph of technical description more than a page long usually has to be reread.

4. *Relegate secondary material to an appendix.* Main ideas will stand out if not buried by incidentals, however pertinent. Data sheets are the worst offenders.

5. *Make full use of visual aids.* Curves and tables that summarize detailed results are invaluable. Most readers have trained themselves to extract the information they need, at a glance. But always supply captions and legends and refer to the figure at that point in the text where the reader needs the information.

6. *Provide white space around the text.* Readers of technical reports quickly reach a point of fatigue. Margins, indentations, space between headings, and short paragraphs relieve the eye — and the mind.

To summarize, the purpose of a technical report is to convey information from one mind to another. If the information misses its mark, both the writer and the reader have wasted precious time. No set of rules can be compiled that will cover ways to meet all the needs of a reader. But perhaps the dozen ideas presented here will help.

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# Books

**WAVES AND THE EAR**, by William A. Van Bergeijk, John R. Pierce, '52, and Edward E. David, Jr., '47; Doubleday and Co., Inc. (95 cents). *Reviewed by Paul Cohen, '35.*

THIS explanation of what is currently known about the hearing of animals and humans has been prepared by three investigators at the Bell Telephone Laboratories as one of the Science Study Series. Several other volumes in this fresh approach to the teaching of physics have been reviewed in these columns previously. These books are directed primarily to high school students, but this does not prevent them from being challenging material to any interested layman.

The present work is exceptionally comprehensive for an introductory text, and bears on every page the authoritative imprint of authors who are immersed at firsthand in the subject they are explaining. Indications that they are themselves working at the frontiers of the field are the frequent references to the problems yet unsolved and to the areas of debate. Reference to the mechanism of good transmission in air, to the techniques of measurement, and to the definition

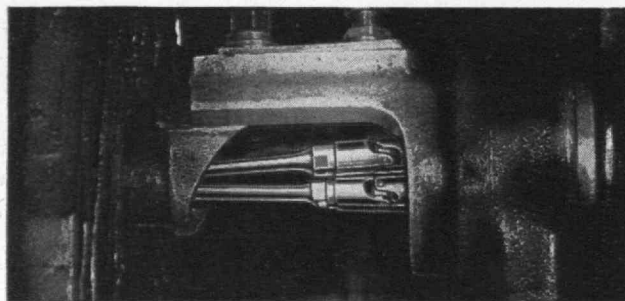
of terms is held to a minimum. Most of the book deals with the mechanism of animal and human hearing, and what the nerves and brain may do with the received signal. "What Do We Hear?" is one chapter heading. "Nerves and the Brain" is another.

A reviewer is like someone looking into a mirror. He tends to see largest in every book those topics which reflect his own interests. In this case, the reviewer, who is interested in controls, computers, and data processing, is impressed by the complexity of the biological transmission system between ear and brain. The auditory nerve, as it leaves the cochlea, contains some 30,000 individual neurons (in man). This nerve branches off into at least 30 times as many extensions as it enters the cortex. Exhibiting a property found in many other brain functions, the auditory response can continue with little apparent deterioration in spite of massive damage to the nerves and brain structure. Nearly half the auditory nerve can be cut before impairment of single tonal response is detected. The authors quote J. C. R. Licklider, formerly of M.I.T., who states that one of the basic facts of neurophysiology is that the nervous system works in spite of a considerable amount of misarrangement — "the principle of sloppy workmanship," he calls it.

In spite of the impressive structure devoted to hearing in the human brain, we do not necessarily do as well as some other animals. A bat can be taught to distinguish between echoes from a cross and a circle of the same surface area. Griffen's work with bats, and Navy-supported work with porpoises, give many other

(Concluded on page 58)

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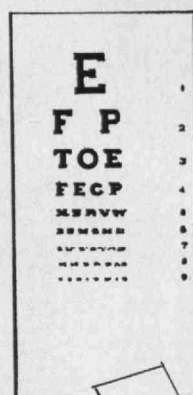
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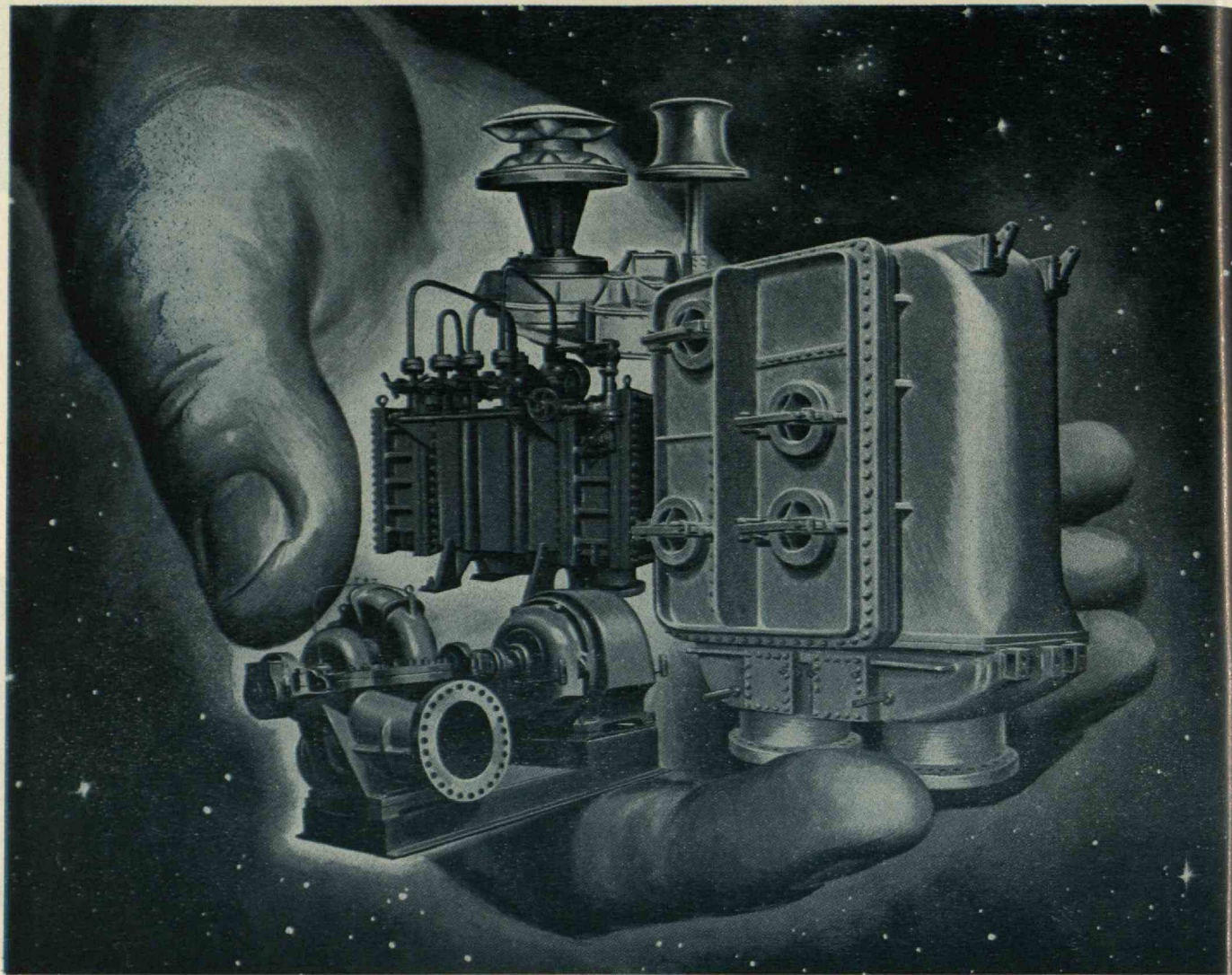
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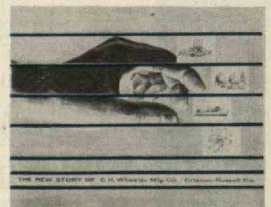
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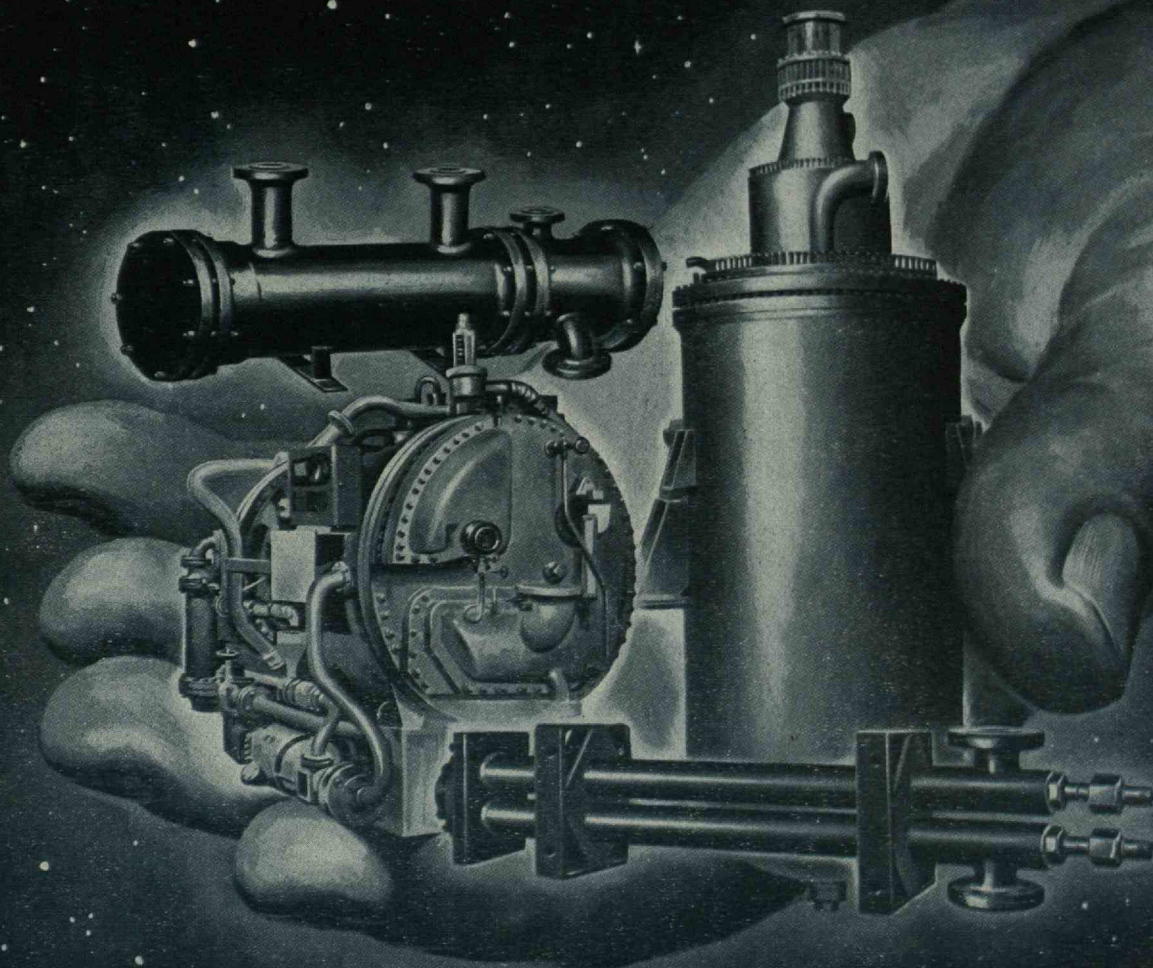
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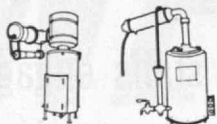
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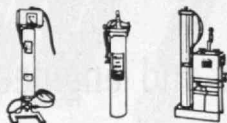
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## Books

(Concluded from page 54)

indications of the remarkable feats of hearing possible in the animal kingdom.

The sensitivity and sound engineering design of the ear should come as no surprise, since investigation of other animal senses, particularly sight and smell, has shown that only by pressing physical instrumentation to the limit can scientists do as well (and not always) as these compact biological devices. A sound striking the eardrum displaces it an incredibly small amount. For sound pressures of ordinary conversation, say the authors, the displacement is about that of the diameter of the hydrogen molecule, or  $10^{-8}$  cm. One of the roles of the tiny bony chain in the middle ear is that of an impedance matcher, a device familiar to electrical engineers. The three bones of the middle ear, the hammer, anvil, and stirrup, act as a leverage system which reduces the minute motion of the eardrum to a more forceful but still tinier motion of the oval window marking the entrance to the inner ear. Since this oval window is much smaller in area than the eardrum, a further increase in pressure results, so that the pressure in the inner ear can be 30 times or more that on the eardrum, compensating in part for the difference in density between air and the body fluids.

The style of the book is easy and informal. An annotated list of suggested reading and an index are included. Although the authors are three in number, the first person singular is used throughout. The authors allege that this artifice makes for simplicity and unity of thought, which leaves the reader wondering whatever became of the editorial "we."

**SCIENTIFIC RUSSIAN WITHOUT TEARS**, by J. Whitney Perry, '31; a pamphlet published by *The Chemical Bulletin*, Chicago (\$1). Reviewed by Secor D. Browne, Assistant Professor of Russian.

MR. PERRY's very readable short introduction to *Scientific Russian* might be called *Scientific Russian Before Tears* since it provides a concise description of the structure and mechanics of the language prior to the student's settling down to the actual pick-and-shovel work of extracting English meaning from a Russian scientific text.

*Scientific Russian Without Tears* will be helpful reading for students about to embark on a group or individual course of organized study of scientific Russian. It is not recommended, nor, despite its title, evidently meant as an escape from the necessary, and sometimes near-tearful, realities of memorization, exercises, and tenacious application.

**PROJECT SHERWOOD**, by Amasa S. Bishop; Doubleday and Co., Inc. (\$1.25).

THE AUTHOR was a member of the staff of the Radiation Laboratory at M.I.T. from 1943 to 1946. This is a paperback edition of his much praised account of the U.S. program in controlled fusion, to which a report on progress between June, 1948, and June, 1959, has been added by Arthur E. Ruark, Chief of the Controlled Thermonuclear Branch of the AEC.

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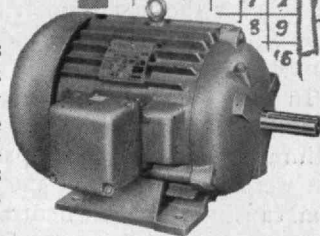
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# Institute Yesteryears

## 25 Years Ago . . .

TRANSMUTATION of atoms of silver into cadmium by means of artificial radioactivity was demonstrated publicly for the first time at a Society of Arts lecture by Professor Robert J. Van de Graaff, of the Department of Physics.

"In his transmutation of elements," said *The Review*, "the speaker produced artificial radioactivity by radium emanation. Alpha particles from this emanation were made to strike the metallic element, beryllium, causing it to emit neutrons, which, upon striking silver, caused the latter to become artificially radioactive. About 20 seconds after these infinitesimal flying particles had bombarded the silver atoms, some of them spontaneously shot out an electron, thus transmuting themselves into cadmium."

¶ In March, 1935, *The Review* reported also that direct production of an unsymmetrical molecule had been accomplished by Professor Tenney L. Davis, '13, and Robert Heggie, '33, of the Department of Chemistry. "For ages plants have been producing such molecules in the form of sugar, nicotine, caffeine, camphor, quinine, and a host of other substances that are familiar and important in daily life.

"Davis and Heggie have accomplished what chemists call a total asymmetric synthesis by causing their chemical materials to combine in a beam of circularly polarized light. Such a beam, in simple language, is made up of twisted light. Moonlight is largely polarized light, and diffuse sunlight contains a large proportion. The experiments support the belief that plants accomplish their asymmetric synthesis by reason of the polarized light in which they live."

¶ Congratulations were being received by three newly elected Presidents: Killey E. Terry, Jr., '06, of the National Association of Pulp and Paper Mills Superintendents; José M. Cadenas, '13, of the University of

Havana; and Donald W. Douglas, '14, of the Institute of the Aeronautical Sciences . . . and by Willis R. Whitney, '90, upon receiving the Edison Medal of the American Institute of Electrical Engineers.

## 50 Years Ago . . .

"AN IMPORTANT step was taken," in March, 1910, declared *The Review's* editor, "when a Cosmopolitan Club was formed, with some 60 to 70 members. Although foreign students are not inclined to get together, immediately on the formation of the Club and the occupation of a club room on Boylston Street, directly across from Rogers Building, the foreigners began to fraternize with each other most cordially, and it is believed that this new social link will prove of great value.

"The officers are: President, E. Olaf Christiansen, '10, of Christiania, Norway; First Vice-president, H. T. Shen, '09, of Foochow, China; Second Vice-president, Manuel A. Navarro, '10, of Quito, Ecuador; and Secretary-Treasurer, David P. Gaillard, '11, of Culebra, Canal Zone, Panama."

## 75 Years Ago . . .

"THIS YEAR there will graduate from the Institute the first class that has completed the work in the Course in Electrical Engineering," observed the editor of *The Tech*. "Although other scientific schools have already prepared men for this profession, yet the Institute is a pioneer in this branch of education.

"Already the electrical engineering department is one of the largest in the school, and, in spite of the fact that until a year or two ago no connected work had been done in this branch of instruction, the arrangement of studies has been wonderfully well planned, and does great honor to the Faculty, and especially to the Head of the department.

"We find everywhere young men who, wishing to gain a practical education, think they can find an opening in the field of electrical work. There is something about electricity and its application which is very attractive. The uncertainty as to the true nature of electricity is to many minds a charm."

¶ And, in an adjoining news column, *The Tech* published the following notice: "The Telephone Com-  
(Concluded on page 62)

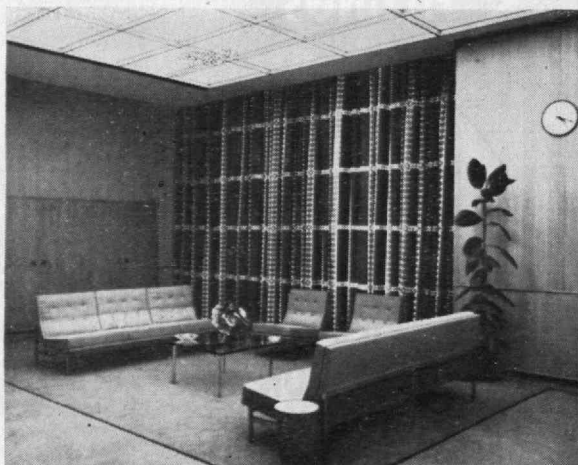
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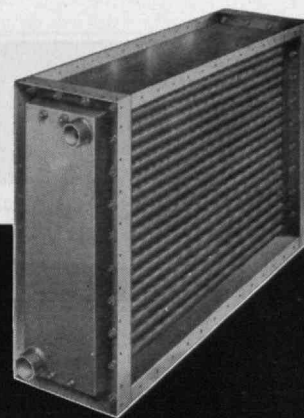
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A new military approval now allows BIW to offer a high temperature, miniaturized coaxial cable having superior mechanical strength of conductor plus stable, low capacitance not previously available under MIL-C-17B. RG-279/U is known as BIW type COX-3FF-24-MG, Pt. #2059-C-G24. It is particularly applicable as a replacement for RG-179/U.

This cable is designed with the object of providing a coaxial cable expected to encounter flexing and vibration over an extended period of time and to retain relatively stable low capacity characteristics throughout its life. It represents a small diameter cable without requiring the extremely small conductor size of #29 gauge. This cable may be readily wound about a 1" mandrel, and may be expected to withstand twisting and sharp bending without kinking.

This cable fills the need for a small diameter, light weight, dependable coaxial cable of intermediate temperature range for missile applications. It is designed to take the punishment of assembly and harness installations and the brief high temperature life of an expendable weapon.

Test data are tabulated below.

### Laboratory Test Report

Cable Type: COX-3FF-24-MG Subject: Change in Capacity with Mechanical Abuse

Cap. Before Conditioning 12" Diam. Coil	Cap. when wound around 1" Diam. Mandrel in one direction	% Chg. in Cap.	Cap. when wound around 1" Mandrel in Opposite Direct.	% Chg. in Cap.	Cap. after 4 hrs. in Cold @ -65° F.	% Chg. Cap.	Cap. after 4 hours @ 400° F.	% Chg. in Cap.
172 uuf/8.75' 19.65 uuf/ft. Temp. 74° F.	174 uuf/8.75' 19.89 uuf/ft. Temp. 73° F.	1.01%	174.5 uuf/8.75' 19.95 uuf/ft. Temp. 73° F.	1.016%	176 uuf/8.75' 20.1 uuf/ft. Temp. -70° F.	1.022%	175 uuf 20 uuf/ft. T. 400° F.	1.019%

### Patented Construction

#### Constructional details in military form follows:

Description	Constructional Details
Inner Conductor	Tinned copper-covered steel wire, nineteen strands, .005 inch diameter. Tensile Strength 55,000 pounds per square inch minimum. O.D. 0.025".
Cable Core	Semi-solid, Type F. Helically wound polytetrafluoroethylene filament, covered with polytetrafluoroethylene tape or tapes to an overall diameter of .090 inch.
Outer Conductor	Single braid, AWG size #36 silver-covered copper wire. Diameter .110 inch Carriers .....16 Ends .....5 Picks/inch .....15 ± 10%
Moisture Seal	Consisting of one wrap .001 inch polyester film tape, applied with a lap of 60 percent of its width. The moisture seal shall be applied tightly in the best commercial manner.
Jacket	Type V one braid. Color: Tan to Brown. Overall Diameter .125 inch ± .005 inch.

#### REQUIREMENTS:

Dielectric Strength.....500 volts rms  
Capacitance.....20 ± 5 mmf/ft.  
Capacitance Stability.....± 5 Percent from  
200° C to -55° C  
Impedance......65 ± 5 ohms  
Temperature Range....-80° C to +150° C

To summarize, RG-279/U is a small diameter, medium-low capacity, flexible, coaxial cable with mechanical strength and stable capacitance over a wide temperature range. We respectfully solicit your inquiries for price, delivery or any other information concerning RG-279/U.

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## Institute Yesteryears

(Concluded from page 60)

pany threatened to remove the telephone from Rogers Building, if its use by students was not stopped."

### 85 Years Ago . . .

ON MARCH 17, 1875, in the Institute building at 491 Boylston Street, Boston, there assembled 23 graduates at 7:00 P.M. for the express purpose of perfecting the organization of the Alumni Association of M.I.T. Officers *pro tem* to serve until the first "Annual Meeting" were elected as follows: Robert H. Richards, '68, President; Channing Whitaker, '69, Vice-president; Charles R. Cross, '70, Secretary. At the first "Annual Meeting," which took place on the afternoon of January 27, 1876, the balloting confirmed Richards and Cross for two-year terms as President and Secretary respectively; and Isaiah S. P. Weeks, '71, was chosen to be Vice-president.\*

### 99 Years Ago . . .

ON MARCH 19, 1861, the Joint Standing Committee on Education of the General Court of the Commonwealth favorably reported a bill for the incorporation of the Massachusetts Institute of Technology. On March 25, the bill was ordered to be engrossed by the House; and on March 29, the same action was taken by the Senate.

\*Richards, Cross, and Whitaker were, respectively, Heads of the Institute Departments of Mining Engineering, Physics, and Mechanical Engineering.

Richards (1844-1945) retired in 1914 and lived to become, on August 26, 1944, the Institute's first Alumnus centenarian.

Cross (1848-1939), who was a close associate of Alexander Graham Bell, founded at the Institute, in 1882, the first course of electrical engineering leading to a degree in the United States. He became emeritus in 1917.

Whitaker (1843-1913) resigned from the Faculty in 1883 to enter private engineering practice. Prior to registration as a member of the Class of 1869, he was a veteran of the Civil War. Enlisting in the 39th Massachusetts Volunteers, he was wounded and taken prisoner at Spotsylvania, and given up for dead by his family, with the result that he later had the extraordinary experience of reading his own obituary in the *Boston Globe* before he matriculated at M.I.T.!

Weeks (1847-1908) was for 23 years chief engineer of the Burlington Lines west of the Missouri River, during which time 3,000 miles were added to the system under his direction.

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and the prophet replied:

*"It is well to give when asked, but it is better to give unasked, through understanding."\**

## *Gifts by Will*

TO THE

## Massachusetts Institute of Technology

The tale is told of Almustafa, the prophet, who, having awaited for many years the ship that would return him to the place from whence he came, was making the final descent to the shore when the folk of Orphalese crowded about him. They besought him before departing to "disclose us to ourselves, and tell us all that has been shown you of that which is between birth and death."

With words of wisdom, an answer appropriate was given to the woman holding a baby, to the ploughman, to the merchant. Begged one, "Speak to us of GIVING," and the prophet replied:

*"It is well to give when asked, but it is better to give unasked, through understanding;*

*And to the open-handed the search for one who shall receive is joy greater than giving. All you have shall some day be given;*

*Therefore give now, that the season of giving may be yours and not your inheritors'.*

Through the years the prophet's words have held true, for even today he who "through understanding" includes the MASSACHUSETTS INSTITUTE OF TECHNOLOGY as a beneficiary in his will can experience thereby a two-fold satisfaction. The successful culmination of his search for a worthy recipient and the anticipated results his generosity will assist in accomplishing. These satisfactions give an added value to the span of man's days and project his usefulness to his fellowmen far into the future.

The Massachusetts Institute of Technology because of the high quality of the education given its students, its effective research work for aiding America in peace as well as in war, and the high character of its governing body and academic staff qualifies as an institution for serving our American ideals for the present and in the years to come.

But the search, the finding, and the anticipated accomplishments are not enough; for without the properly-worded record, man's plans for the future may go awry. Hence the prophet's importuning, "— give now," should be heeded. The giving need not be an immediate physical transaction, for written directions replace the spoken word when the speaker is no longer present, and a donor can frequently make by will a gift which is larger than he can make while living. Truly, *"it is well to give when asked, but it is better to give unasked, through understanding."*

A booklet "Gifts by Will," outlining different forms of bequests to M.I.T., is available to you or to your attorney by writing to:

Director of Development

Massachusetts Institute of Technology

Cambridge 39,

Massachusetts

\* "The Prophet" by Kahlil Gibran

# Club Notes

## Baltimore Club Invites High School Teachers

The M.I.T. Club of Baltimore has invited faculty members of local secondary schools to attend the 1959-1960 meetings of the club. Dr. Elbert P. Little's very interesting presentation October 14, 1959, was attended by 15 physics instructors, math instructors, guidance counselors, and principals.

A meeting planned for March 3, 1960, will have a similar group in attendance when the subject of relativity will be discussed by Dr. Louis Witten of the Research Institute of Advanced Study, Baltimore, Md. In May a meeting on "Industrial and Technical Advances in Russia" is planned. Thus the presentation of worthwhile technical subjects is combined with the strengthening of the valuable link between M.I.T. Alumni and the faculty members of local high schools.

The M.I.T. Club of Baltimore, this year, is headed by Hyman J. Verner'23; the secretary is Jane Steiner'40. — CHARLES A. SPEAS'42, *Program Chairman*, 6901 Avondale Road, Baltimore 12, Md.

## Women's Association Holds Graduate Student Night

On December 1 the Women's Association met for dinner at the Faculty Club and after dinner heard a talk by Dr. Thomas B. King.

Dr. King had recently returned from Russia where he attended meetings on steelmaking and vacuum metallurgy. His talk was entitled "Russia in the Eyes of a Metallurgist."

This was also the annual graduate student night designed to acquaint the women graduate students with the association. — ANNA BAILEY'54, *Secretary*, 61 Columbia Street, Brookline, Mass.

## Washington Club Meets With Students

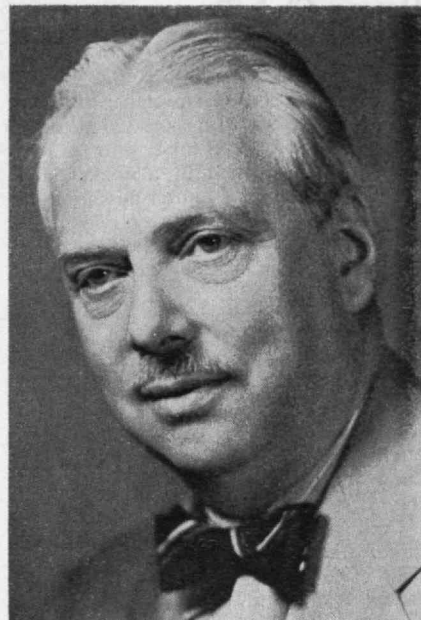
Twenty-three M.I.T. students home for the Christmas vacation, and 20 high school students from the Washington area were guests of the M.I.T. Club of Washington at its annual luncheon and get-together held on December 28, 1959. Present as hosts were 20 Alumni including Major General C. E. Loucks, USA (Ret)'31, President of the club. After enjoying an excellent luncheon at the Cosmos Club, those present heard talks by General Loucks who welcomed the students; William Strauss'61 who spoke on student activities at the Institute; and Colonel Boris T. Pash, USA (Ret) who gave an interesting description of the role of civilian scientists in military projects overseas during World War II. The highly successful affair was under the direction of Robert W. Blake'41, past president of the M.I.T. Club of Washington. — LT. J. G. BEEBE-CENTER, JR.'56, *Secretary*, 3516 Lowell Street, Washington 16, D.C.

## Hartford Turns Out To Hear Whitman

The M.I.T. Club of Hartford started off the year 1959-1960 in a most auspicious way with one of the finest meetings in recent history on October 28. Walter G. Whitman'17, head of the Chemical Engineering Department at M.I.T., addressed the club at the Connecticut General Life Insurance Company's new building in Bloomfield, Conn. Professor Whitman certainly proved to be a wonderful speaker. He talked about a wide range of subjects including the increasing aptitudes and abilities of the students entering M.I.T., and our educational system. He correlated this with the present world situation and noted that we are living in a world of continual crisis. He pointed out that this may be the normal state of affairs in today's fast moving world and pointed to the trouble in the Middle East and North Africa, the Caribbean, and China as illustrations. Professor Whitman also brought the world situation into the political arena and made some very relevant observations on the sound and fury of political campaigns. His talk was diversified and particularly timely.

This meeting marked the first time that the Hartford club has utilized the beautiful facilities of the Connecticut General Life Insurance building. Prior to the meeting an excellent roast beef dinner was served at Connecticut General in their auditorium. The meeting was attended not only by club members, but also by invited guests from industry, financial circles, and other business areas, as well as from local schools and colleges. Altogether over 250 people were present, an encouraging and enthusiastic turnout.

On February 16 a meeting, which also bodes well to be a high spot in the year, will be held at the Travelers Insurance building. Dinner will be served at Travelers, after which the meeting will take place in the auditorium. Our speaker for the evening



John E. Burchard'23, Dean of the School of Humanities and Social Science at M.I.T., is scheduled to speak to the M.I.T. Club of Kansas City on March 23, and to the M.I.T. Club of St. Louis later in March.

ning will be Columbus O'D. Iselin, Professor of Oceanography at M.I.T., who is stationed at the Woods Hole Oceanographic Laboratory. He will cover a wide range of subjects, from the laying of undersea cables to submarine activities. Dr. Iselin was featured on the *Time* magazine cover. He is such an outstanding speaker that we are confident that this February meeting will also be a noteworthy and well attended function. — FRANKLIN P. SEELEY'42, *Secretary*, 186 South Main Street, West Hartford, Conn.

## Dr. Killian on World Tour

ON FEBRUARY 1, Dr. James R. Killian, Jr.'26, Chairman of the M.I.T. Corporation, and Mrs. Killian left for a trip around the world by air, during which he was scheduled to deliver three major addresses and visit several M.I.T. Alumni groups.

In England, he planned to visit the Imperial College of Science and Technology, meet with the Minister for Science, and speak at a luncheon of the Parliamentary and Scientific Committee.

In Istanbul, he was to visit Robert College, the president of which, Dr. Duncan S. Ballantine, formerly was a member of the M.I.T. Faculty.

In Beirut, Dr. and Mrs. Killian were to be entertained by Alumni from several Near East countries.

In India, Dr. Killian was to speak at Delhi University, visit the Institute of Science and Technology in Patrala, and confer with representatives of the Ford Foundation. He also expected to see members of the staff of the M.I.T. Center for International Studies who are conducting studies in India.

In Australia, Dr. Killian was to speak at the International Congress of Scientific Management in Sydney, on "The Growing Edge of Innovation."

After spending a day in Honolulu and a day in San Francisco, the Killians will return to Boston on March 5.

## Detroit Club Tours Chrysler Missile Plant

The opening meeting of the Detroit M.I.T. Association on November 12, 1959, was a huge success with some 125 members turning out for the first tour of the Chrysler missile plant by a non-affiliated group. Redstone and Jupiter missiles in all stages of production were on view. The tour was arranged through the good offices of Tom Morrow '35, Chrysler group Vice-president.

An informal meeting followed on Friday, December 11, 1959, arranged particularly with the ladies in mind, and over 60 members, wives, and guests attended. Dinner was followed by a demonstration of sound, from Edison's first recording, to the very latest in stereophonic sound. We already know of at least two wives who are pressing for stereo sets!

Credit for the informal meeting should go to Chuck Ricker '42, our new Vice-president of programs. When business reasons forced Ralph Cross '33 to resign, Chuck moved up from treasurer, and Jay Gilmore '51 became our new treasurer.

Future club activities will be a tour of the new National Bank of the Detroit main office around the early part of March, a steel mill tour in April, and a country club dance in May. — W. JAMES MAST '53, 420 McKinley Road, Grosse Pointe Farms 36, Mich.

## Central Ohio Club Holds Alumni-Student Luncheon

December 30 was a banner day for the M.I.T. Club of Central Ohio as attendance at a noon luncheon meeting exceeded the highest mark set in recent years. The meeting, regularly held on the first Wednesday of each month, was called between the holidays at the University Club in Columbus, to meet and become somewhat acquainted with several of the Tech students who were home at this time. All members enjoyed the opportunity to meet the young men and get the current slant on extra-curricular activity at M.I.T.

The students attending as guests were: W. L. Case '63, O. L. Fleckner '62, D. W. Hosterman '63, B. A. Nelson '60, and T.A. Welch '60. Alumni members present were: P. M. Bernays '39, J. H. Butler '29, A. G. Hall '27, W. A. Horton '42, W. E. Kellam '49, R. R. Litehiser '19, G. W. McClary '51, B. M. McDill '18, W. P. Moser '48, G. R. St. Pierre '51, I. Stollman '48, R. N. Tucker '28, and E. L. Whitaker '31. — WILLIAM A. HORTON '42, *Secretary*, Columbus and Southern Ohio Electric Company, 215 North Front Street, Columbus, Ohio.

## Southern California Hears Weatherall Speak at Dinner

The educational counselors and the board of governors of the M.I.T. Club of Southern California gave a dinner at the Mona Lisa in Los Angeles, on December 1, 1959, for Robert Weatherall, Assistant to the Director of Admissions at M.I.T. Mr. Weatherall spoke on the college entrance exams as well as the general requirements for college admission. A most interesting aspect of his talk concerned the type of student that attends M.I.T. Even more interesting was the fact that 80 per cent of

## Deceased

WILLIAM J. LUTHER '84, December 15, 1959  
N. P. AMES CARTER '87, December 12, 1959\*  
ROBERT W. CARR '95, December 25, 1959\*  
BRADLEY STOUGHTON '96, December 30, 1959\*  
JOHN S. BOYD '97, December 28, 1959\*  
SUMNER M. MANLEY '00, October 24, 1959\*  
WILLIAM O. KENNARD '01, October 24, 1959\*  
D. LEIGHTON ORDWAY '01, December 7, 1959\*  
ROLAND E. TITCOMB '02, December 21, 1959\*  
ELIZABETH D. CHADWELL '05, 1958\*  
E. BRUCE HILL '05, October 27, 1958\*  
ARTHUR PERKINS '05, December 7, 1959\*  
LAURENCE G. BLODGETT '06, August 14, 1959\*  
FRANK R. VAN DER STUCKEN '07, February 24, 1959\*  
WILLIAM C. FOLSON '08, December 18, 1959\*  
CHARLES W. MORRISON '08, December 8, 1959  
RENS E. SCHIRMER '08, January 3, 1960\*  
R. W. JACOBY '10, December 14, 1959\*  
SIMON NATH '11, November 7, 1959\*  
HOLLAND R. WEMPLE '13, December 27, 1959  
SAMUEL M. FOX, JR. '15, no date given\*

the students at M.I.T. come from public schools.

Educational counselors in attendance were Chairman Page E. Golsan, Jr. '34, Philip K. Bates '24, Robert M. Copsey '44, Robert E. Hiller '31, T. Gary Loomis '44, Samuel E. Lunden '21, and Frank A. Yett '40.

Board members present, excluding those who are also counselors, were Hiram E. Beebe '10, James S. Cullison '41, Victor Stanley '44, Raymond B. Stringfield '15, Robert Welles '15, Richard S. DeWolfe '36, and Louis Young '50. — JOSEPH W. MARSHALL '53, *Secretary*, Bymco Engineering, 904 West Hyde Park Boulevard, Inglewood, Calif.; LOUIS YOUNG '50, *Assistant Secretary*, 2234 South Spaulding Avenue, Los Angeles 16, Calif.

## Central Pennsylvania Host To Professor Charm

We have received news that Colonel Randall Hogan '22 of York, Pa., recently passed away. Colonel Hogan had served as Vice-president of the M.I.T. Club of Central Pennsylvania and was also on the Educational Council. Those who knew Colonel Hogan deeply mourn his passing.

The Central Pennsylvania area was visited on December 3 by Professor Stanley E. Charm '52 of the Department of Food Technology at M.I.T. While in the area to assist the Educational Council, Professor Charm addressed the students at the Cedarcliff and Susquehanna high schools in the Harrisburg area, and the high school in York. Those meeting with Professor Charm at the time of his visit were Messrs. Hal Spaans '30, Marshall Holcombe '36, Karl Katz '50, and yours truly. — ROBERT K. PETERSON '48, *Secretary*, 566 Brentwater Road, Camp Hill, Pa.

## New York City Holds Directors' Meeting

1960 began with an officers' and directors' meeting held January 13 at the club's quarters at the Hotel Biltmore. The outlook for 1960 is excellent, with focus on tradition and continuity as organization policies and

activities continue to develop. The 1960 club membership directory was published recently for distribution to all members who have remembered to remit dues for this year. Any non-members interested in obtaining a copy may inquire through the club's executive secretary, Miss Maxine Gilliland, M.I.T. Club of New York, c/o Biltmore Hotel, 43rd Street and Madison Avenue, New York 17, N.Y.  
The club is open weekdays until seven in the evening. Alumni, students, and staff members of the Institute are cordially welcome to stop in to enjoy the serene atmosphere right in the heart of New York City. The daily professional graces of Gene Ulreich, host, and veteran club servers Richard Jones and Frank Tuzio are always inviting, too.  
Coming between March 25 and 31 on Long Island is the section's annual dinner meeting featuring, appropriately, the subject of food technology. Bob Franklin '34 and Mike Costagliola '41 are working at making this meeting as successful as Long Island's travel dinner which drew a hundred people. Credits for that dinner belong to Ralph Krenkel '46 and R. Dixon Spears '40. March 15 is the date set for the Westchester section's next dinner meeting spearheaded by Ed Goodridge '33, and to be held at the Scarsdale Country Club.  
Outline for the spring season includes three more technical seminars, organized by Gaby Garbarino '33 who has been responsible for the first three excellent seminars to date. The club's annual meeting, for all three sections combined, is coming between April 20 to 30. On May 15 Long Island has a plant visit scheduled, similar to last year's tour of Brookhaven National Laboratories. Westchester will wind up the year's festivities in the first part of June with a traditional afternoon golf party and evening dinner meeting in Scarsdale.  
There are some interesting new developments in the offing. The best way to keep posted is to join the club and receive the newsletter *M.I.T. in New York*. Otherwise, read the club's column in the April issue of *The Technology Review*. — JAMES M. MARGOLIS, *Secretary*, 5 Fenton Street, Rye, N.Y.

\*Further information in Class Notes.

# Class Notes

'87

We recently received a letter from Oscar E. Nutter along with a newspaper clipping concerning N. P. Ames Carter. Mr. Nutter's letter states as follows: "I am writing regarding N. P. Ames Carter, who was secretary of the Class of 1887. He died on December 12, 1959. I believe he and I were the only '87 men in this locality, and we were in close touch with each other. I called upon him only two or three weeks before he died. When the Class of 1887 entered the Institute the activities were confined to one building, Rogers, and the first president had died just one year before."

The following is taken from the *Springfield Sunday Republican*: "Mr. Carter lived in Chicopee Falls all his life until the last few months when failing health caused him to give up his residence of many years at 22 Grove Avenue. Throughout the greater part of his life he devoted himself to the progress and welfare of the town and, later, the city of Chicopee. He was one of the pioneer electrical contractors in this area, maintaining his business in Springfield for more than 30 years prior to his retirement in 1920.

"As a member of the Chicopee School Committee for 30 years and chairman for 24 of those years, Mr. Carter led the movement which resulted in the building of the present high school and was instrumental in bringing about several other educational advances. He was chairman of the Chicopee library board for 12 years in the early 1900's. He was vice-president of the Chicopee Falls Savings Bank for many years, and had been elected to another term last Friday, the day before his death. He was known as 'the father of the Chicopee Kiwanis Club' for his interest and efforts in getting the club established. The Reality Club, a discussion group of Springfield area men, claimed him as its oldest member and one of its most enthusiastic participants.

"Mr. Carter was born in Chicopee Falls, April 11, 1864, during the final campaigns of the Civil War. He prepared for M.I.T. at the Chicopee High School and Williston Academy. As an electrician and electrical contractor, Mr. Carter began several years before the general use of electric light in this section. He hung out his shingle in Springfield about 1888 when there was not an electric street light in the town and hardly a single light bulb. On April 25, 1894, he married Miss Ruby Blaisdell, also from Chicopee Falls.

"At the onset of World War I, Mr. Carter plunged more deeply than ever into community service. Governor McCall appointed him and the late Eugene J. O'Neil to head the Chicopee public safety committee. After the war ended, Mr. and Mrs. Carter began a series of extensive trips abroad. On his voyages he took many pictures and gathered information which he presented

in numerous illustrated lectures and discussions during one period of his life. He was an enthusiastic and skillful gardener. His large grounds were for many years among the beauty spots of the community.

"From the time of his youth Mr. Carter was devoted to the Congregational Church of Chicopee Falls, which he served for many years as clerk and on several occasions as chairman of committees to select a minister. He wrote a history of the church for publication in connection with its centennial observance a few years ago. His interest in schools and children was never better illustrated than by his strong advocacy of school extension work, including the formation of clubs for canning, gardening, and bee and poultry culture.

"Among the organizations with which Mr. Carter had been associated, in addition to those already mentioned, were the Engineering Society of Western Massachusetts, Men's Club of his church, Springfield Yacht and Canoe Club, Hampden County Improvement League, Foreign Policy Association, Allen Bird Club, Springfield Garden Club and the Gladden Club.

"Mr. Carter leaves a daughter, Ilsa (Mrs. Eliot L.) Wight of Longmeadow, two grandchildren, Mrs. Harold A. Chamberlin of Wayland and S. Blaisdell Wight of Tucson, Ariz., three great-grandchildren and several nieces and nephews." — D DE F.

'91

Many years ago I was spending a short vacation in Stowe, Vt., assisting a joint Unitarian-Orthodox Church to become a community center. As it happened, an aged woman, living on a farm in the wilderness under the shadow of Mt. Mansfield, had died. As there was no settled minister in the area, the family asked me, a stranger, to officiate at the funeral. The woman had been distinguished in one respect; she had reached the age of 104.

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## Happy Birthday

Among the Alumni of M.I.T. now there are 81 nonagenarians and 789 octogenarians. Birthday greetings are in order during March to one who is due to become 90, to six and ten who are due, respectively, to celebrate their 85th and 80th, as listed below with dates of birth:

March, 1870 — CHARLES M. TAYLOR'93, on the 16th.

March, 1875 — CHARLES H. DEERING'99, on the 4th; FREDERICK A. WATKINS'99, on the 9th; CLIFTON A. TOWLE'03, on the 12th;

FRANK E. UNDERWOOD'97, on the 22nd; CONRAD LORING'99, on the 25th; and GEORGE R. GAENSLER'03, on the 28th.

March, 1880 — DAVID SUTTON'04, on the 4th; HERBERT W. DAY'07, on the 6th; ANDREW H. HEPBURN'03, on the 6th;

WALTER K. GILLET'05, on the 9th; GILBERT TOWNSEND'02, on the 10th; CHARLES O. EGERTON'04, on the 14th.

HAROLD A. EVERETT'02, on the 18th; THEODORE A. SAMMIS, JR.'04, on the 28th; JOHN E. TRULL'03 on the 29th; and JOHN C. DAMON'05, on the 30th.

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I went to the old farmhouse to visit the family and I asked the great-grandson about the deceased: "Was she sick a long time?" "No," he said, "she got up this morning and smoked her clay pipe as usual." Then I turned to the doctor and asked "What did she die of?" "Oh," he said, "just an accumulation of limitations which is the result of old age."

The following is taken from an editorial in *Iota Muse*, Phi Gamma Delta's alumni periodical of December, 1957: "How much we owe to those who gave us Phi Gamma Delta. Of course to our founders at Jefferson College, but in particular to the eight who, in 1888, brought Phi Gamma Delta to M.I.T. Of the original eight charter members only one survives; Brother William F. Keene, second Fiji to be initiated into our chapter and the oldest living Iota Mu.

"Much has changed since Brother Keene's days, when M.I.T. was situated on old Boylston Street near Clarendon. The college, then comprising two imposing buildings, had an enrollment of about 1200. Brother Keene chose to concentrate his efforts on the field of civil engineering, and remembers that he was required to complete courses in calculus, structures, applied mechanics, and railroad engineering, to mention only a few. The work load was very heavy, he tells us. Those surely were the good old days with tuition for the year running at \$200-\$300.

"Brother Keene relates that M.I.T., in the 1890's, was considered to be the outstanding engineering school in the country; a reputation little diminished through the years. The only two schools offering serious competition were Stevens Tech and Troy Polytech — known to us today as R.P.I.

"Our chapter came into being as a result of a desire of four brothers-to-be, Keene, Elisha Lee'92, Woodruff Leeming, and Clement March, to form a Technology chapter of one of the oldest men's fraternities. They decided on Phi Gamma Delta. After contacting four others (Robert Bissell, Robert Paul'92, Elmer Kraft'92, and Albert Goetzmann'92) and following a lengthy period of correspondence with national headquarters, Frank Keek came to Boston and installed Iota Mu. The young chapter had no house in those days, but fared as best it could under the circumstances. Average membership stood at about 15.

"After graduating in 1891, Brother Keene went to work for the Interstate Street Railroad Company, as an assistant engineer. In 1896 he became city engineer of Central Falls, R.I., in which capacity he served until 1912, when he left the engineering profession for the business world. As the years slipped by, Brother Keene found himself in Bermuda, England, France, and Italy, as well as parts of North Africa including Casablanca, Algiers and Tunis. His journeys have taken him to Florida and California during the winter months, and several times to Canada.

"So fond has Brother Keene been of moving about that he has owned and driven an automobile continuously since 1902. He enjoys each summer among the mountains in Rochester, Vt., and makes the 280-mile drive alone from his home in Great Neck, L.I. In 55 years of driving he has never had an accident! That's quite a record. At

the young age of 87, Brother Keene looks forward to many more full years. We all wish him the best of health and happiness." — WILLIAM CHANNING BROWN, *Secretary*, 15 Forest Avenue, Hastings-on-Hudson, N.Y.

'95

January 6 we received one of our December 25 greetings to our Eighty Plus Club members with a press clipping from a Texas (?) paper stating that Robert Wentworth Carr, Sr., age 87 years, of 2140 Nacogdoches Road, San Antonio, Texas died Friday, December 25, at his home. He was a member of St. Mark's Episcopal Church. Survivors: wife, Mrs. Robert W. Carr, Sr., San Antonio; sons, Robert W. Carr, Jr., San Antonio, Colonel Richard P. Carr, Stead Air Force Base, Reno, Nev.; daughter, Mrs. Dave Woodward, San Diego, Calif.; and eight grandchildren. This brings our Eighty Plus Club down to 20 members as of January 1, 1960.

On January 7, last, your secretary and his devoted wife Edith (B. Morton) celebrated their wedding anniversary quietly at their home in Ayer, Mass., completing 57 years from their early business life in Pittsburgh to their present home life in Ayer, Mass., interspersed with trips about the country. — LUTHER K. YODER, *Secretary*; A.D.F. *Assistant Secretary*.

'96

The secretary learned from his daughter, on her return from a high school physics conference in Schenectady, that Will Coolidge had just come home from a trip around the world. Herewith is Will's response to an S.O.S. for an account of his trip: "Dorothy and I have just returned from a 72-day round-the-world tour by air, organized by World Travel Tours, of California. The group consisted of a tour director and 22 members. It was, for me, very pleasant to find that I shared the honor, with another of the six male members of the tour, of being both a Tech and a Course VI man, the other being Page E. Golsan '12. The various professions represented, included farming, engineering, science and school teaching, and most of the members had traveled widely. This last, doubtless, accounts for the fact that they were always on time, regardless of the hour, always pleasant, and remarkably free from fault-finding, regardless of the necessary hardships of such travel. Pacific and Atlantic crossings were made by Pan American Airways, while other air travel involved 11 other companies. Planes ranged from 707-jets to Viscounts and DC-3's.

"On the flight from Hawaii to Japan, I had, for the first time, a birthday party in the air with champagne and birthday cake served to all, courtesy of Pan American. Having spent 40 days in Japan in 1947, it was interesting to see the great strides which Japan has made since then in recovering from the war. Of the people in the various Asian countries visited, the Japanese seemed more on their toes than any of the others. We were also much pleased here by the friendliness shown us, especially by

its spontaneity and obvious sincerity in the case of the young children. In the Philippines ours was the first world tour for five years to be taken to Corregidor. Here we visited, among other things, the Malinta Tunnel, and were shown the lateral leading from it to the former underground quarters of the MacArthurs. In Manila, we became acquainted with the jeep, a locally modified U. S. jeep, of which the Philippines now has 34,000 in use as small buses.

"In Hong Kong, members of the party, seemingly without exception, patronized tailoring establishments where one could select, from a wide assortment of fabrics, the material for clothing to be fitted and completed during our three-day stay, and at a price one third lower than at home. Victoria, the capital of Hong Kong, is a beautiful city with a superb location. A few miles from there, in the New Colonies, we came to the boundary of Hong Kong, and looked into Red China. The four-day visit to Bali was interesting and enjoyable. While there, we witnessed five different local dances. These were all performed with meticulous precision by participants, each trained from early childhood for his particular role. It was to us a demonstration that, by such training, even unlettered people could, and doubtless did, hand down through generations their history and traditions." To be concluded.

Bradley Stoughton died of a heart attack in Bethlehem, Pa., on December 20, 1959. He was the first dean of engineering at Lehigh University where he was professor of metallurgy. He taught at Tech and Columbia before practicing as a private engineer. He had much experience in iron and steel making with several producers. In World War I he was a member of the Engineering Company of National Defense and in World War II he was head of the foundry equipment unit of the tools section of the War Production Board (and of heat treatment). During the 1920's he made a study for the Federated Engineering Societies of the technical aspects of shifting, by the steel companies, from a 12 to an 8-hour day. His report was used by President Harding in his successful effort to have this shift made. He was prominent in several engineering and manufacturing societies concerned with metals. His first wife, Grace Van Everen '96, died January 16, 1905, and in 1911 he married Louise Merwin Roe who survives him as do two sons, Philip of New York and Sandroe of Switzerland; two daughters, Mrs. Rosamond Draper of Sea Cliff, L.I., and Mrs. Leila Fehr of El Cerrito, Calif., and a sister Mrs. Benjamin I. Spock of New Haven.

George E. Harkness and his wife Virginia have left Lake Worth for this season and are now at Orlando, Fla., Box 419 East, Route 6. The civil engineers will remember that George joined us as a Sophomore having entered with '95. The year off was spent afloat; doubtless his marine experience was of great benefit in his dock and bridge designs; especially in the construction of the bridge over the tidal Piscataqua River near the Portsmouth Navy Yard. . . . There was also a card from Henry Sears who still lives in Wichita in peace and security despite an unfit "trigger finger." Fortunately, this election year does not feature any question such as the one many years ago which called forth volunteers

from Massachusetts to aid in the fight for freedom, else Henry would be hors de combat. Yet this year we hear the same election slogans "world freedom," "civil rights" and "integration," which Kansans and allies thought they had settled 100 years ago. — JAMES M. DRISCOLL, *Secretary*, 129 Walnut Street, Brookline, Mass.; HENRY R. HEDGE, *Assistant Secretary*, 105 Rockwood Street, Brookline, Mass.

'97

We have word that John S. Boyd, Course V, died December 28, 1959. He retired a number of years ago and was living at Monument Beach, Cape Cod, Mass.

Last December, a member of the M.I.T. public relations office interviewed Walter Humphreys and we are happy to quote the article sent us by The Technology Review office: "For more than half a century, Walter Humphreys has served the Massachusetts Institute of Technology. He was awarded the first certificate of appreciation ever to be presented at an M.I.T. commencement, in 1954 by Dr. Karl T. Compton, who was chairman of the Corporation at that time. It read in part: 'Since 1899 you have served M.I.T. with inspiration. . . . Few have given the Institute so much for so long, none has been more conscientiously devoted to her welfare.'

"Mr. Humphreys came to M.I.T. in 1893 at the encouragement of his grandfather who thought he had the Tech makeup. As an undergraduate he was vice-president of his class, a member of the board of *Technique*, secretary of the Institute Committee, and a member of Delta Kappa Epsilon fraternity. He received his S.B. in Mechanical Engineering in 1897 and has served the Institute as secretary's assistant to the Faculty and registrar, instructor in Mechanical Engineering, registrar, recorder, and secretary of the Corporation. Dr. Killian recently announced his election as honorary secretary of the Corporation.

"Besides his positions at M.I.T., Mr. Humphreys also has been active in the wool industry. He left the Institute in 1922 to become secretary-treasurer of the National Association of Wool Manufacturers, treasurer of the Association of Wool Industries, and secretary of the code authority of the wool textile industry.

"He is a former president of the American Association of Collegiate Registrars, and a past treasurer of the Association of Alumni Secretaries. He has also been active in community affairs in Brookline, where he now makes his home. He was chairman of the Brookline school committee and a trustee of the Brookline public library, and is a member of the Brookline Historical Society and the Brookline Thursday Club. He also belongs to the American Newcomer Society, the Faculty Club of M.I.T., and the Down Town Club of Boston. He has been a director of the Harvard Co-operative Society since 1918 and has the singular honor of holding the number 1 on his Coop card!

"Mr. Humphreys, the son of Dexter and Maria Townsend Humphreys, was born in 1874 in the same stately white house where nine generations of Humphreys have grown

up to become leading members of the community. The first, Jonas Humphreys, a Puritan, arrived in Dorchester 1637 from England where he had been a glove maker by trade. He became constable of the village and was prominent in the running of church-governmental affairs. A later descendant, the Rev. James Humphreys, was minister of the Dorchester church. He marched into the pulpit on the Sabbath carrying arms, and posted sentinels at the entrance of the church to avoid surprise from the Indians. Said Walter Humphreys, when speaking about this far-sighted ancestor: 'That was the beginning of our preparedness.'

"While reminiscing about the past, Mr. Humphreys related with a chuckle his proudest moment, taking Mrs. Rogers (wife of the first president of M.I.T.) and Julia Ward Howe (author of the 'Battle Hymn of the Republic') to Symphony Hall, 'and they were both shorter than I.'

"Mr. Humphreys is married to Victoire Elizabeth Casgrain and has four children, James, George Casgrain, Marie Van Dyke and Henry Dexter. They live at 249 Clinton Road in Brookline in a house that was designed by Tech students. Commented Mr. Humphreys with a twinkle: 'They made the stairs high so I can help tall guests on with their coats.' — AUGUSTUS C. LAMB, *Secretary*, 61 Hillcrest Place, Amherst, Mass.

'99

These notes are being written from my son Leighton's (M.I.T. '33) home in Melbourne, Fla. He is in charge of the engineering group at the Avco Corporation's missile test station at Cape Canaveral. I have received no class news and with the deadline coming up, I am forced to fall back on some personal recollections that may be of interest.

It may be remembered that your secretary chose the chemical course at M.I.T. and took all his options in bacteriology. Samuel C. Prescott<sup>94</sup> had been appointed in September of that year as instructor in the Biological Department. On the death of Professor Sedgwick he became head of the course and today is Dean Emeritus. I value highly our 64 years of friendship. One day William Lyman Underwood of Belmont, a member of the William Underwood Company, sought the help of the department to find out why some of their products had gone bad. Professor Sedgwick turned the problem over to Prescott. He solved the mystery by research on temperature penetration by inserting small maximum thermometers in the center of the cans and putting them through the regular sterilizing process, and by a series of other treatments. He discovered that spores of heat resisting bacteria in the midsection of the can were not killed due to insufficient heat applied too short a time. This was the start of Dr. Prescott's interest and fame as a food technologist. This incident was mentioned in an article in the *Saturday Evening Post* (November 28, 1959), which relates the story of deviled ham in much more detail.

There were no specialized courses in the humanities at Tech in the "gay nineties." So when your secretary became a patho-

genic bacteriologist in the Boston Health Department laboratories in 1900, he had to start learning fast how to meet and handle the public. This was learning the hard way and experience is a stern taskmaster. But the value of these "lessons" leads me to endorse Tech's present humanities curriculum all the more strongly. — BURT R. RICKARDS, *Secretary*, 349 West Emerson Street, Melrose 76, Mass.; PERCY W. WITHERELL, *Assistant Secretary*, 82 Prince Street, Jamaica Plain, Mass.

'00

Sumner Manley, II, died suddenly on October 24, 1959, at Yorktown, Va. He had been living in St. Petersburg, Fla., and Freedom, N.H., but was preparing to move to Yorktown to be near his son. Sumner was a native of Brockton, Mass., and after graduating from Brockton high school he entered M.I.T. with the Class of 1900. After graduation he was a draftsman for three years with the Silver Spring Bleaching, Dyeing, and Printing Company of Providence, R.I. From 1903 to 1904 he taught mechanical engineering at Kansas State College. In 1904 he went to the Procter and Gamble Company in Kansas City as master mechanic. He joined the engineering department of that company in Cincinnati, Ohio, in 1911, and later became chief engineer. In 1930 he became a consulting engineer for Procter and Gamble and Thomas Healey and Company, Inc., of Newcastle, Manchester, and London, England. He was in England for about three years, superintending the construction of three plants for the Healy Company in the cities named. After returning home he continued consulting work for Procter and Gamble at their Quincy and Dallas plants.

Sumner was married to Susanna P. W. Talbot of Brockton and had two children, Robert T. and John T. Both sons went to the University of Wisconsin. Robert is a mechanical engineer with Vendo in Kansas City, and John a chemical engineer with the United States Naval Weapons Station in Yorktown, Va. Mrs. Manley died about 1941 and Sumner later married Mrs. Katherine Rankin Williams, a childhood neighbor and playmate, who survives him. Sumner was a member of the American Society of Mechanical Engineers and the Engineers' Club of Cincinnati. He was also associate member of the Institution of Mechanical Engineers in England. — ELBERT G. ALLEN, *Secretary*, 11 Richfield Road, West Newton, Mass.

'01

By the time you read these notes you will have received the class letter. As you get the news of the Class from The Review during the year, the class letter is now just a summary of the chief events and a financial report. As I have received only 28 replies from the Class during the last year and have already given you the information contained in them, these notes for March will be quite limited. I hope that you will be more helpful during the coming year,

otherwise the notes will be few. What some of you apparently do not realize is that as we get older and our numbers fewer we are interested more and more in the little everyday things that our classmates are doing. Keep this in mind and let us know what you have for breakfast, what you do with yourself during the day, and so forth.

My sad duty this month is to report the deaths of two more classmates. William O. Kennard, VI, died on October 24 at his home in Lake Wales, Fla. He was 81 and was a retired Portsmouth Naval Shipyard employee and a former resident of Eliot, Maine. He moved to Lake Wales after his retirement in 1948. He was widely known in Masonic circles and was an important member of various Lodges in Portsmouth, Kittery, Eliot, and Portland. He leaves his wife, the former Lulu Tracy. . . . From a notice in a Boston paper I note the death of D. Leighton Ordway, V, in Newton Center, Mass., on December 7. He was not married. He was a regular attendant at most of our recent reunions and will definitely be missed at future reunions.

I am counting on more replies during the coming year. — THEODORE H. TAFT, *Secretary*, Box 124, Jaffrey, N.H.

'02

R. Elbert Titcomb died in Ipswich, Mass., on December 21, 1959. He attended M.I.T. for the full four years and I'm sure many of you will remember him outside of those in Course XIII. He and I went through Newburyport high school together, and were old acquaintances. After leaving M.I.T., Titcomb went to Cornell and was graduated in 1903. He was a native of Rowley where his father was engaged in the meat business. Titcomb joined with his father and carried on successfully in nearby Ipswich. He is survived by his wife, Miriam Waters Titcomb.

For some 40 years, as I attended the old Second Church here in Salem, I passed the Roger Conant statue which pictures the Puritan founder of Salem. I did not know until a couple of years ago that a member of '02, William N. Brown, had posed for the painting from which Kitson, the sculptor, got his concept of the old Puritan settler. It seems that it was made known to Tech students that the artist, Earnest Fosberry, needed young men to pose for him and Brown applied and earned a little pocket money. . . . At the engineering conference of the Technical Association of the Pulp and Paper Industry, better known as TAPPI, held last October, an award for services rendered was presented to Dan Patch. The industrial engineering and materials handling committee presented him with a Scheaffer pen and clock desk set inscribed "To Dan Patch, in recognition of his contribution to TAPPI, October, 1959." Dan has been to every engineering meeting since 1946 and is the only original member left on the committee.

Everyone seems to agree that television has wonderful possibilities as an educational medium, and in support of this claim I offer this incident received through the family grapevine: The paternal grandfather was visiting the family. At bedtime the four-year-old asked his mother, "Where

is your daddy?" She replied, "He is dead." Four-year-old, "Who shot him?" Mother, "Nobody shot him. He just died." Four-year-old, "Probably didn't eat right." — BURTON G. PHILBRICK, *Secretary*, 18 Ocean Avenue, Salem, Mass.

## '03

LeRoy Thwing is encouraged that his book *Flickering Flames*, a story of early New England lighting practices, is having a second printing. He is now making a study of the architectural features of the Bulfinch Capitol for future publication. . . . Colonel Walter H. Adams is enjoying his leisure in Glendale, Calif., but Fred B. Crosby has left his beautiful home in Redondo Beach to be nearer to some of his children. He is now living at 2904 Ashland Avenue, Muncie, Ind. . . . Hewitt Crosby is reveling in sunny Florida at Sarasota and is pleased to make it his permanent home.

Clarence Joyce is active in local affairs in Kearny, N.J., and is already making plans for an extensive summer trip. . . . Robert J. King, our class agent, makes his home in New Cannan, Conn., and is doing his bit to keep up class interest. . . . John J. A. Nolan is writing historical articles about early Cambridge incidents. How about sending in an account of your recent activities before they are forgotten? — LEROY B. GOULD, *Secretary*, 36 Oxford Road, Newton Center 59, Mass.; AUGUSTUS H. EUSTIS, *Treasurer*, Box 1422, Boston 4, Mass.

## '04

A few Christmas cards were received from classmates for which we give thanks but we wish there had been more news items. We were glad to learn that few complained of physical infirmities and Holcombe even bragged of his robust health. This was backed up by a picture showing him about to swing a golf club, but his wife, seated in front of him, looked a little fearful that the blow might fall on her. . . . You may have missed a small item in the January Review which stated that our western vice-president, Harry Rollins, was due to cross the line into his eighth decade on January 22. You will have plenty of '04 company in that select group, Harry, before long. "Happy birthday to you."

Holcombe recommends Florida sunshine for stimulating good health and as a veteran sun worshipper his opinions are entitled to respect. But to really get one's blood circulating and the cobwebs removed from the brain, there is something to be said for a brisk walk along the Esplanade in Boston and over the Harvard Bridge to M.I.T. Today the temperature is in the twenties, there isn't much wind, the sun is shining brightly and such a walk is invigorating and enjoyable.

There are no obituaries this month and although January 1 is already several weeks in the past we wish you all, north, south, east, or west, the best of everything in 1960.

The above lines had just been written when the postman delivered a letter mailed in Detroit with the following item of interesting news from Frank Davis. He and Mrs. Davis plan to leave New York February 17 on the "Empress of England" for a three weeks' cruise to South America and the Panama Canal. On the agenda is a visit with the Currier Langs in their new winter home at Saint Thomas, Virgin Islands. We hope to hear more of this trip and are glad to get the news in time for inclusion in these notes. — CARLE R. HAYWARD, *Secretary*, Room 35-304, M.I.T.; EUGENE H. RUSSELL, JR., *Treasurer*, 82 Devonshire Street, Boston, Mass.

## '05

An exchange of Christmas cards brought returns from over 50 classmates and fortunately, with many of them, news, which was very acceptable to this news hawk. Space prevents a listing of all classmates replying, but I can quote as concisely as possible from some. From Edith Steel: "Ted sends his best to all. He can no longer read and write due to a deteriorating eye condition. Otherwise he is very well, enjoying his grandchildren, the family pets and short walks in the neighborhood." His address — Edward T. Steel, Del Vista Drive, Valparaiso, Ind. . . . From Bill Spalding: "We didn't get East this year. I had a struggle with arthritis all summer, but am more moveable now." . . . From Willard Simpson a beautiful card, featuring the blue bonnet, the state flower of Texas, also awarding me a subscription to the *Texas Parade*. If this is similar to *Texas Brags*, a bulletin, which I picked up on a visit to Texas, I'll have to remind Willard of the big new state of Alaska.

Dick Senger writes: "The leg which was smashed January 30, 1957, still bothers me some after a 15-month session in the hospital, followed by a seven-month ditto. I have to use a cane, but take several 20-minute walks each day. Hope to get to the Atlantic coast next fall." However, his questionnaire, in regard to the 55th reunion says: "Impossible to attend." . . . Gene Kriegsmann reports: "We made a 7500 mile trip around the U. S. last fall, but did not get to New England. Got home just missing a 100-mile gale with snow. You cannot battle weather in Idaho." . . . Robert F. Luce writes: "The name of your town intrigued me sufficiently that I am sending you the little news I have. Of course, you knew I had retired from the U. S. Coast and Geodetic Survey many years ago, and that for several years I had been teaching civil engineering at the University of Maryland at College Park. Retired there two years ago, and although my health is excellent, I'm completely retired and am enjoying traveling, mostly in the South, with a month or so at the finest beach in the country, Myrtle Beach, S.C."

Bertrand Johnson writes: "Still recuperating from last year's cancer operation." . . . Myron Helpern reports: "My news is both good and bad. We have five children, three girls, all Radcliffe, who are married to three fine men (one is a Tech man); and two boys. We have 10 grandchildren. I am still working and the two boys, regretfully

Harvard, show signs of being completely able to take over when I quit." Thanks, Myron. I assume the bad news refers to Harvard, as there's nothing bad in having 5 children and 10 grandchildren.

I wish you could see the unusual (everything Percy does is in that category) Christmas card of Percy Goodale. The cover in color shows Santa Claus sitting in front of a bright blue stars and crystals background, with Percy dressed up in brilliant Bermuda shorts, bald as a billiard ball, sitting smilingly in Santa's lap. As a special attraction I'll bring it to the 55th reunion. . . . From George Fuller: "My wife passed away May 11, 1959, from cancer, while we were in Florida. I was in the hospital three times this year in July, September, and December. Had two operations. Am feeling better now and hope to return to Florida (Leisure City, homestead) after January 1." . . . Erwin Bender writes (from Chatham, N.J.): "There are no '05 men around here, but there are about 100 young Tech men at the Bell Labs, a few miles from here. I was retired in 1952 and had the privilege of joining the Old Guard of Summit, N.J., a group of retired executives ranging in age from 65 to 90. We meet every Tuesday, 200 strong, for lectures by prominent engineers, plant movies, and visits to industrial plants in New Jersey and New York."

Carlton Atwood says: "My biggest adventure this year was a week in St. Louis, attending an annual convention of the International Society of Grapho-Analysts (not anthropologists). Over 500 analysts from all over the U. S. and several foreign countries attended. I received a certificate as certified analyst and hope to continue with their postgraduate study for another two years. This seems to be quite a departure from engineering but I find it very interesting for a retired engineer to have something to do which will benefit others. I have a Sunday school class, Grade 7 (age 12) boys and girls, who may need something I can give them." Fine work, Carl, but what is a grapho-analyst?

Also received Herb Bailey's regular Christmas letter to family and friends. I have quoted it verbatim at times and have found out from several classmates that it was highly appreciated. However, because of the wealth of news items this month, I am putting it into my April folder. The penalty for this wealth of material is that my contributors can rightfully expect a personal reply. Some I have already thanked; the others may expect similar appreciation.

I had recently received notice from M.I.T. of a change of address to Bartlesville, Okla., for the Ben Lindslys, but later a letter from Ben told me that he and Leslie are, temporarily at least, living at 4150 East Van Buren, Phoenix, Ariz., basking in summer sunshine. . . . The Ted Mooreheads returned last fall from another trip around the world: "We were gone 10 months. The countries we found most interesting were New Zealand, Ethiopia, Kenya, Belgian Congo, Peru, Guatemala and Mexico. Am still a grandfather with nine grandchildren, aged 2 to 21." On their return they relocated at 279 Lee Street, Oakland 10, Calif. . . . Edward C. Smith regrets his inability to attend the 55th reunion as Mrs. Smith is a semi-invalid.

Mr. and Mrs. Lovell H. Parker celebrated their golden wedding anniversary on August 11, 1959. A picture of the happy couple appearing in the Washington, D.C., *Star* indicates that Lovell is still in business for himself. . . . Mr. and Mrs. Frank W. Brownell of Winnipeg, Manitoba, celebrated their 50th on January 16, 1960. I was tipped off on this in time to send congratulations. . . . Bob Young comes out of his lethargy long enough to tell me that he is well and spends much of his time traveling. Planning a trip to California he asked for the names of '05 men in that state so he can make contacts. A great idea for I have just noticed that on a trip last fall the Gib Towers stopped at Falls Church, Va., where I am sure the Ben Lindslys were living at the time.

In a letter to Piggy Bartlett, I commented on the fact that Dan Harrington had told me that only at M.I.T. was he called Dan. Piggy says that Dan is Dan because Pink Fisher called him that at M.I.T. Same with Zeke Coffin: "both named after some Hyde Park characters Andy knew. I had my nickname all through the grades, high school, and Tech. You can be sure nobody would ever forget it." I can remember that I picked up two nicknames at Tech that I had never heard before or since. . . . Dez Schonthal writes, on the date of his 79th birthday, that he and his wife are in good health and hoping to attend our 55th.

Returns from the questionnaire on the 55th reunion have been coming in well. At present 38 men and women have signified that they expect to attend. A considerable number prefer the weekend prior to Alumni Day, and Cape Cod as the place, but many precincts are yet to be heard from. One check for dues was marked "final," which reminds me that Grove Marcy in his secretary's report in our *Ten-Year Book* stated: "The salient points of our financial history is that we have never had a deficit, have only assessed dues when necessary, and so have kept in good standing a larger percentage of our membership than any class having a constitution requiring payment of annual dues."

A very interesting result of an exchange of Christmas greetings is a 60-page brochure from the Hunter Press of Milford, N.H., entitled *The William and Charles Museum*. Edith Hunter is the daughter of Andy Fisher. She is nationally known as the writer of several religious education books, published by the Beacon Press, Boston, and as co-author of the curriculum used in most Unitarian (and other liberal) church schools. The head and assistant curators of the museum are youngsters in the Hunter household and they, as well as their mother, have done a wonderful job, not only in equipping the museum, but in the publication itself. It would prove mighty interesting to your grandchildren, as well as adults. The price is \$1.00, address Hunter Press, Milford, N.H. (Secretary's note — If I have made any mistakes, I'm sure Andy will correct me.)

Because of the length of this column, I will also keep in reserve for April rather long and interesting notes from my best correspondents, Willard Simpson, John Damon and Gib Tower. I have to report sadly (a letter from his son Alexander) the death of E. Bruce Hill, IX, at Pittsburgh, Pa., on October 27, 1958. . . . Mail to Miss

Elizabeth Chadwell VII, Sanford, Fla., was returned marked "deceased, 1958." . . . Arthur Perkins, I, who was with us in our Freshman and Sophomore years died at Larchmont, N.Y., on December 7, 1959. — FRED W. GOLDTHWAIT, *Secretary and Treasurer*, Box 32, Sandwich, N.H.; GILBERT S. TOWER, *Assistant Secretary and Treasurer*, 35 North Main Street, Cohasset, Mass.

## '06

It may seem out of date in March, but early in January we feel like expressing our thanks for your Christmas cards and especially for the helpful messages many of them contained; George and Elsie Guernsey had reached Winter Park by mid-December having had a fine trip down, golfing twice. Daughter Helen had a son earlier in December, the ninth grandchild. . . . Allyn Taylor reported: "Expect to spend the holidays with some of our 11 grandchildren (are the Taylors still out ahead?). Personally I'd prefer to spend the next reunion somewhere on the Cape; however, we'll be glad to accept the vote of the majority." . . . From Will and Helen Farley: "Our 50th wedding anniversary was the highlight when dear friends and family helped us celebrate. Our first four granddaughters are in college — a senior, a junior, a sophomore, and a freshman. We are well and busy." Thanks, too, for those kind words.

Early in January Jim sent me some material for these notes. He said: "Christmas last year and this have been different as I have found myself in situations which we all must face at one time or another and which should make us more conscious of our blessings when we are free from stress and sorrow. Alma's death left me and my sister in the more than 100-year-old, 10-room house where we had lived since 1927. We decided it was too large for us, sold it on October 19, moved out on the 27th, and into new quarters on December 16. In the mean time I stayed with my son and his wife and the three grandchildren in Winchester, at 18 Brooks Street. The house at 7 Brooks Street, where we are now living, was modernized under the direction of my daughter-in-law and it is most attractive. I spent a week at Christmas in West Simsbury, Conn., where my daughter and her husband, with two children, make their home. Under the circumstances I was not in a position to do much about Christmas. I appreciate very much the cards I received from classmates and wish I had time to write to all, for I do want my classmates to know that I have not forgotten them and I look forward to more normal days ahead and our 55th in 1961."

In the November notes I mentioned receipt of a card from Lebanon from the traveling Hoefers. In the January 10, *Boston Herald*, under Women's Club News, was this item: "Women's City Club, Tuesday, 11 A.M., clubhouse, Mr. and Mrs. C. A. Hoefer speakers." Jim's sister has been a charter member of the Women's City Club for 40 years, and as Jim thought we would be interested, his sister invited Marion and me to be her guest at the Hoefer talk, with Jim along of course. The club bulletin had announced that Mrs. Hoefer would tell

about their trip last summer to Afghanistan and show some of the pictures they had taken there and in other countries they visited, quoting her thus: "One of the most interesting of the 56 countries we have toured is the little kingdom of Afghanistan, where we spent five weeks. Kabul, its capital, 6000 feet above sea level, has veiled women, dust storms, pilgrims traveling to Mecca, gypsies, hot days, cool nights, and the beautiful snow-capped Hindu Kush mountains. We traveled on to Kashmir, then Iran (old Persia) and Persepolis where the giant ruins bear mute evidence to the glory of Xerxes, Cyrus, and Alexander. A strange, wonderful part of the world."

The day came and we joined Jim and Mrs. Kidder in the club's fascinating old Beacon Street mansion with its purple panes, interesting architecture, crystal chandeliers, curved walls, spiral stairs, heritage furniture — I could go on and on, for an account of its history, previous owners, interiors and contents would fill a book. Mrs. Hoefer has served the club on its program and other committees for many years and had previously given talks on their travels so she was warmly applauded when she took her place at the mike. Chester had set up his projector and as a preface to Ruth's talk, traced their four and a half months' summer tour on a map studded with pins at their various stops, which included a 3200-mile trip by car through central Europe on the way home. Of the 400 pictures taken, Chester showed about 100 and as they were thrown on the screen Ruth described the scene with a running story that was very interesting, informative, and entertaining. Truly, a strange, wonderful part of the world, with marvelous and priceless examples of a civilization, architecture, and craftsmanship going back in places to 2000 B.C.

As these notes were in progress there came a letter from Phil Stanley, II, saying he had recently learned of the death on August 14, of Laurence Gould Blodgett, I, at his home near Horse Shoe, N.C., Laurie had taken up farming after retiring, and devoted much of his energy to various civic and community affairs in that area. He had suffered a slight stroke, followed by pneumonia. He leaves his wife, a son, a daughter, and two grandchildren. As you may recall, Laurie's career was included in the notes in the March 1957 Review. Phil also included other news — Max Coe retired from the Stanley Works a few years ago and lives near by. Phil sees him frequently, although Max spends the summer on the Connecticut shore at Madison and goes down to Clearwater around the first of the year, staying until April: "As for myself, I seem to find enough things to keep me busy, partly business and travel and playing rather indifferent golf. Most of my summer is spent at Fisher's Island and I try to be away for a month or two in the winter, in Florida or on a cruise."

Terrell Bartlett wrote: "I fear I will not get to Boston until our 55th in 1961 now only a year and a half away. How they fly by! We made a short trip to Cleveland in August to see our youngest grandniece, daughter of the younger of the two nieces we had with us at the 1946 reunion. Went to Kansas City and Chicago to see cousins and returning we stopped a few days at Gatlinburg to see the Great Smokies." A

note from Fred Batchelder reported that he and his wife hoped to spend the winter in Florida, and Otto Blackwell said it looked as though he could make it in '61. . . . George Hobson reported from Portland that he is now the (unpaid) secretary of the Maine Society, Sons of the American Revolution, which: "is enough work to keep me from being bored with life." . . . Frank Benham is at 1234 South Ridgewood Ave., Daytona Beach, Fla., where he is now a permanent resident, although he retains an apartment in Arlington which he occupies in the summer. — EDWARD B. ROWE, *Secretary-Treasurer*, 11 Cushing Road, Wellesley Hills 81, Mass.

# '07

Your secretary appreciated and thoroughly enjoyed the Christmas cards which came from several of the '07 men. Sam Marx always sends a card that expresses his creative ability as a designer — just a bit out of the ordinary also. Lev Cutten designs and sends his own cards, about 150 of them. This year, the front of the card was a pencil rendering of a photograph showing Leverett and the silver altar set which he designed, made, and presented to Bates College last June. The greeting page was his own composition.

Don and Sarah Robbins had a pencil sketch of their new home in Barrington, R. I., on the front of their card. It is a most livable house, and our president is a most genial host. Look him up when you are near Providence. . . . Hud Hastings noted on his card that the reunions at Oyster Harbors are too many years apart. Possibly we could get enough '07 men to spend a weekend each year at the club. . . . Frank MacGregor, writing from Tryon, N.C., wished to know when and why the secretary's home town had changed the spelling of its name as printed in the December Review. Frank, as a loyal Tech man, did not consider it possible for a typographical error to occur in *The Review*. The spelling is the same — Whitinsville — (pronounced Whitingsville). The change was the printer's idea, Frank.

I had a nice letter from Sam Marx, in which he wrote of his frequent luncheons with John Frank, and their disappointment at not making our reunion last June. Sam is not too well, but he says: "I'm a confirmed optimist, however, and hope to be able to attend our next reunion on Cape Cod." He left early in January to spend the winter in Jamaica and hoped the sunshine would do him some good. Sam did not mention the kind of sunshine which would be most beneficial.

Leverett Cutten writes that he started working on the collar which he hopes to complete and present in the name of our Class to the Institute. It seems such a collar should be worn by the marshal when carrying the mace in a procession. So far, only Yale, Bates, and Florida Southern have both a mace and a collar. Lev celebrated his 79th birthday last November 19 and is: "determined, in spite of arthritis, bursitis, and other indications to slow down, that I will manage to make the collar and enjoy doing it. I want to keep kicking as long as I live."

Many of the men will recall Frank R. VanderStucken as the individual in Course I who never carried a set of logarithm tables to exams. The reason? He had them memorized. The Class lost trace of Frank for many years. Finally, it was learned that he was retired and living in Switzerland. Now his sister writes to the Alumni Office that he died a year ago on February 24, 1959. Van was a very lovable Dutchman. — PHIL WALKER, *Secretary and Treasurer*, 18 Summit Street, Whitinsville, Mass.; GARDNER S. GOULD, *Assistant Secretary*, 409 Highland Street, Newtonville 60, Mass.

# '08

The second of our dinner meetings of the 1959-1960 season was held at the M.I.T. Faculty Club, Cambridge, Mass., on Wednesday, January 6, 1960, at 6 P.M. The weather was favorable so we had a good turnout, the following answering the roll call: Bunny Ames, Bill Booth, Nick Carter, Fred Cole, Leslie Ellis, Paul Norton, Miles Sampson, Henry Sewell and Joe Wattles. We were favored with the following guests: Mesdames Ames, Ellis, Mayo, Sewell and Wattles. We missed the Freethys and Hatches who couldn't make it this time. As usual we gathered in the cocktail lounge, which was crowded, but we managed to capture a table and enough chairs so we could all be together. While enjoying our favorite appetizers and the fine cheese, crackers, potato chips, and so forth, from the buffet, we learned news of classmates not present. About 6:30 P.M. we adjourned to private dining room No. 1 and decided what we each wanted to eat. As usual the food and service were excellent. After dinner Joe Wattles showed us some Kodachromes taken by Paul Norton during a recent trip to California to visit relatives. Included were a couple of views of the National Shrine of the Immaculate Conception at Washington, D.C., which was dedicated in November, 1959. Paul was responsible for the structural design. It's certainly a beautiful building. Paul says the dedication was most impressive with five cardinals taking part, in full regalia.

Joe then showed us Kodachromes taken during a Mediterranean tour which he and Eudora enjoyed some time ago. We adjourned about 9:30 P.M. after a most enjoyable get together. The third dinner meeting at the M.I.T. Faculty Club will be on Wednesday, March 9, 1960, at 6 P.M.

Bill Milne, who until his retirement in 1951 was manager of the Eastman Inspection Bureau, has written a new book, *Fire Risk Analysis* published by Chilton Co., Philadelphia, Pa. Bill lives on his farm in Lexington, Mass. . . . Karl Kennison and Mrs. Merle F. Hunt were married on January 1, 1960, at Darien, Conn., and are living at 19 Salt Box Lane, Darien, Conn. . . . Frank and Mrs. Towle are enjoying a six weeks' trip to the Orient. . . . Joe and Eudora Wattles have been in Florida since January 10.

We are sorry to report the death of Rens Schirmer at his home in Franklin, N.H., January 3, 1960. The following from the *Boston Herald* of January 5, 1960, will be of interest: "Rens E. Schirmer, 73, was a

graduate of M.I.T. in 1908 and of the Columbia University School of Mines in New York. He was a mining engineer and geologist for many years, working much of the time in the West. Later he was associated with the Brookhaven National Laboratories, Long Island, and the General Electric Company's Knolls Laboratory, operated for the Atomic Energy Commission in Schenectady, N.Y. He was a 32nd degree Mason.

"He leaves his wife, a daughter, Mrs. Mary S. Howe of Governor's Island, Lake Winnepesaukee; a son, David A. of New Canaan, Conn.; a brother, Dr. Walter Schirmer of Needham, Mass.; a sister, Miss Margaret Schirmer of Boston, and five grandchildren.

We are sorry to report the sudden death of Cub Folsom at his home in Washington, D.C., on December 18, 1959. Committal services were at Wyoming Cemetery, Melrose, Mass., December 23, 1960. Leslie and Helen Ellis attended the services.

Remember we are to celebrate our 52nd at Melrose Inn, Harwichport, Mass., on the Cape, June 10, 11 and 12. Make your plans to be with us. — H. LESTON CARTER, *Secretary*, 14 Roslyn Road, Waban 68, Mass.; LESLIE B. ELLIS, *Treasurer and Assistant Secretary*, 230 Melrose Street, Melrose, 76, Mass.

# '09

We are continuing to present messages received relative to the reunion. George Palmer, VII, writes from Berkeley, Calif.: "It's a shame that I can't come to the 50th reunion of the Class. Furthermore, I note that Courses VII, VIII, and XII will not be represented at all. You have asked for a letter summarizing how I have kept busy during the last 50 years so here it is." Summarizing, George graduated from the University of Rochester in 1907 (B.S.); B.S. M.I.T., 1909; M.S. 1911. He started with the State Health Department, New Jersey; from 1914-1917 he was chief of the investigating staff on the commission on ventilation, New York State; 1918-1919, he was first lieutenant and captain, U. S. Army. He consecutively held positions of increasing importance in health work in Detroit, Mich., and New York City, becoming assistant chief of field research, American Public Health Association; assistant to the surgeon general, U. S. Public Health Service, Washington, D. C.; 1947-1959 he was consultant in public health training and administration, California State Department of Public Health. In 1923 he was awarded the degree of doctor of public health by the University of Michigan. This is certainly a distinguished career. George retired in 1959 stating: "Easing up — general handy man — gardening, painting, building stone walls, reading books, newspapers, detective stories, doing crossword puzzles; and so forth. Also doctoring for soriasis of both feet and finally carrying out orders of the director — my wife. It's been a happy, fruitful, and fascinating experience throughout. I have no complaints. Sedgwick's Course VII — Biology and Public Health was the starting point for the later years. My best wishes to the Class of 1909. I hope you have a good turnout."

Kenneth May, VI, who attended Alumni Day, states: "We have three married children (two daughters and a son) and 15 grandchildren. One daughter with her husband (in the oil business) and eight children live in Waban, Mass., while the other (her husband is now with DuPont in Buffalo but shortly to be transferred to Florence, S.C.) has four children. Our son (now comptroller of Amherst College) lives in Amherst, Mass., with his wife and three children. I am still in the investment business with F. S. Moseley and Company in Boston."

The Reverend Elmo Robinson writes from the Unitarian Fellowship of Los Alamos, N.M.: "I regret that I shall not be able to attend the 50th reunion. I have never been able to attend any reunion. For 30 years, until last June, I was busy teaching philosophy at the San Jose (California) State College, and was never free at reunion time. Now I am here more or less temporarily as minister of this fellowship. This new relationship has brought me into contact with M.I.T. men, mostly of a younger generation. Many of the names on the list of those who plan to attend are familiar in a hazy sort of way but a few call up visual recollections. I remember one of the Shaws (the peppy one), E. Q. Adams, George Emerson, Arthur Morrill, Maurice Scharff, and Florence Luscomb. If it should be convenient, give them my greetings."

Alice Mason, secretary to Tom Desmond, I, advises us that Tom is the author of an article in the December, 1959, issue of *The Rotarian*, the magazine of the Rotary Clubs of the United States and Canada, entitled "When to Retire — and How."

In the February issue of *The Review* we reported the marriage of Joan Clark to Mr. Richard Moroney. On behalf of the Class, the Secretary congratulated her and her husband and sent a modest wedding gift. She replied as follows: "Thank you so much for the check from the Class of '09. You're wonderful to think of doing something for me. I plan to spend it for a permanent remembrance from you all. M.I.T. is very much remaining in the family. My husband received his B.S. in Electrical Engineering from Tech in '51 and after four years in the Air Force returned for graduate work. He's presently working on his doctorate in mathematics. We're very comfortably settled in an apartment near Harvard Square. While Dick is studying and instructing at Tech, I keep busy with a job at Badger Manufacturing doing technical service work. Thank you again. We both appreciate the wedding gift." — CHESTER L. DAWES, Secretary, Pierce Hall, Harvard University, Cambridge 38, Mass.; Assistant Secretaries: GEORGE E. WALLIS, 185 Main Street, Wenham, Mass.; FRANCIS M. LOUD, 351 Commercial Street, Weymouth 88, Mass.

# '10

I regret that I have to announce the death of Ray Jacoby on December 14. Carroll Benton received the news firsthand from Mrs. Jacoby. Carroll's letter is as follows: "I called him the day before to see if he intended to attend the monthly luncheon on Wednesday, De-

cember 16. I didn't get him but Mrs. Jacoby answered and seemed quite upset. She was just leaving to fly down to Raleigh where Ray had been taken to the hospital the day before after suffering a stroke on the plane. Last spring, as I think I wrote you, he spent several weeks in the hospital with a heart attack. At the luncheon, a card of sympathy, signed by those present, was sent to Mrs. Jacoby. I shall also drop her a note expressing my personal sympathy. Ray was present at the November luncheon and seemed to be in good health and fine spirits. Afterwards, he and I walked down to Grand Central Station together and he told me that he felt fine and thought he was well over the earlier heart attack."

Ray was very successful in his career as a chemist. He was president of the American Association of Textile Chemists and Colorists in 1955 and 1956. He held a temporary professorship in the department of textile chemistry at North Carolina State College during the spring semester of 1955. At the time of his death he was a consultant.

I received a letter from Dick Bicknell with a notice of Ralph Gage's (Geg) death which was given in the last issue of *The Review*.

In the last issue of *The Review* I stated that the first notice for the 50th reunion would be in your hands before that issue. It did not happen that way. Jack Babcock and the committee were delayed in getting out this advance notice. I assure you this notice will be received before reading this. One thing this error did was to have Harold Akerly write asking for information as he sails for Italy in April and does not return until June 8. He still will have time to be present at the reunion. Before sailing he must complete some consulting work in Florida as a member of a school survey staff. He says it looks like another busy winter.

Every year Bieny Bien sends me the Boxford Bulletin Christmas greeting. This year he gave a most interesting description of his trip to the Dismal Swamp: "The Dismal Swamp, often called The Great Dismal or The Dismal, is a vast area extending from around Norfolk to Edenton, N.C., on Albemarle Sound. In fact, the swamp extends intermittently all the way to the tip of Florida taking in two other great swamps, the Everglades and Okefinokee. The swamp extends inland 50 miles or so to form a great band of flat lowlands flooded with water from a few inches to several feet in depth. Here and there are considerable areas which are sufficiently above water for farming, roads, and towns. Elsewhere, there is dense forest growth. Many ditches were dug years ago mostly by slave labor, to drain the land for agriculture and there is considerable rich and productive land.

"I had read much about the Dismal Swamp and was, therefore, forewarned of the dangers. People have been lost for days requiring the organization of large searching parties, sometimes comprising several hundred men. Dogs and cats have been lost and some turned wild. It was stressed in all these accounts that people should not go into the swamp without competent guides. Not to get lost ourselves, we located a man in Suffolk who said he

was the only authorized guide for the Dismal Swamp. I asked if he could guide us on a trip into the swamp. His reply came on bank stationery to the effect that he had a lodge which would accommodate 18 persons on Lake Drummond itself, and that he would be most happy to have us visit him as long as we wished as his guests.

"The lake and the swamp were like nothing we had ever seen. Many trees are quite a ways from the shore and grotesquely shaped. The swamp which extends all around the lake for many miles has numerous ditches. The dirt was spread on one side or the other to form a road of sorts. An automobile can actually be driven in. Another peculiarity of the place is the water. It is just about the color of tea or fresh clear cider. However, it is tasteless, or rather like any other water, and was used in ancient times by mariners who stored it in wooden casks, for it has the faculty of retaining its sweetness for long periods — ordinary water often became very stale and unpleasant. It tasted like any other water except chlorinated city water. The color is derived apparently from down timber accumulated to a great depth over many hundreds of years, especially at the bottom of the lake.

"Another striking aspect of the swamp is the presence of snakes. We were cautioned about them. We were told that they hung on trees over the ditches and would drop down in your lap if you were in a boat or take a nip out of the back of your neck as you passed. These snakes were no proper playmates for anybody for they were copperheads, water moccasins, cotton mouths, and worst of all, rattlers, the big dangerous diamond-back rattler. The bite of any of these is lethal unless treated very promptly. However, we saw nary a snake — only one poor little green snake whose life was crushed out on the highway.

"I have often wondered why it is that on those few occasions when I can get away for a few days I should seek out lonely isolated places rather than follow the crowds to Atlantic City or Chicago, neither one of which I have ever seen or desire to. That is probably why we went to the Dismal Swamp. Though quite accessible, it is infrequently visited and for the most part only by hunters and fishermen in the fall. It is the wildest and most intriguing bit of country I have ever seen and yet there is beauty there. I felt after I had visited there as if I had been to some place out of this world which had little to do with our everyday world." — HERBERT S. CLEVERDON, Secretary, 120 Tremont Street, Boston, Mass.

# '11

A letter in January from Don Stevens gave this unhappy news: "Due to circumstances beyond my control I regretfully resign from my position as 1911 president. The advances of ill health, hopefully temporary, but none the less disabling, have made it peremptory for me to take this action on the demand of my doctor. I take this step most reluctantly, and only after a prolonged period of attempting to overcome my difficulties." We're sorry that this

step was considered a necessary one, and sincerely hope that Don will eventually overcome his difficulties and be completely well again.

Sallie Denison's sister, Dr. Mildred Dixon, has been living with Sallie at Well-sweep since her retirement from social service work in Worcester, Mass. They visited the Roy MacPhersons in Framingham for a week last November. A recent letter from Sallie says: "I am trying to work on my hobby of painting, and as I haven't done much along those lines for two years I am very rusty, but I am going to keep at it and see how many trays and such I can get done this winter. Spring will be along before we know it, and then I'm awfully busy with the gardens."

Roy MacPherson had a letter and a Dennie memorial fund contribution from Louise Seeley, widow of Nathaniel Seeley. Louise went on a trip to South and East Africa, with two friends, in the winter of 1958. She is now living at 115 Van Rensselaer Avenue, Stamford, Conn. . . . Dave Allen, II, welcomed his daughter and her children back from the Belgian Congo to attend school in the States, preferable to those in the Congo. His daughter's husband is in the automobile business there.

Guy W. True, I, wrote recently: "I haven't met a single 1911 man in the last 30 years. If I can make it to the 50-year reunion maybe I can catch up." Part of his activities since graduation include about 15 years on the canal projects in Panama, and about nine recent years with William C. Olsen, Consulting Engineer, in Raleigh, N.C. His present address is Box 2681, Raleigh. . . . A letter was received in January from Allston T. Cushing, I, who was with us in our senior year. He was retired in 1950, after 28 years in government service. Since then he has had various jobs and done some consulting work, and says that with this other income and his pension he and his wife get along very comfortably. His three children are all married, and he has seven grandchildren. His present address is 6638 Bellefontaine Avenue, Kansas City 32, Mo.

Paul Cushman, VI, and his wife Otilie sent a long and very interesting letter outlining their many activities during 1959, and the following is a part of the letter: "We keep well. July to January we are third vice-presidents of the Silver Spur Square Dance Club. Paul is captain general of his commandary and deputy master of his council (Masonic), and Otilie is in the Daughters of the American Revolution, American Association of University Women, church committees and a bridge group. We continue our Faculty Club activities, and attend engineering functions and football games at Oklahoma University. Paul reached retirement in his teaching at O.U. in June, but continues as part-time chief engineer and metallurgist at the L. and S. Bearing Company here, and August 6 also started working part-time under the auspices of the O.U. research department at Tinker Air Force aeroplane and jet repair base at Midwest City, as research associate on bearings. January 21 and November 18, with an Oklahoma City team, Paul took the part of Knight Commander of the Temple, for the Scottish Rite, at Guthrie. January 31, with a busload, we attended the northwest district square dance jam-

boree at Alva, in a bad snow storm. West of the Great Salt Plains our bus surprised hundreds of jackrabbits.

"March 14, at the annual engineering banquet, along with the Lieutenant Governor, Paul was made an honorary knight of St. Patrick, since he was to retire. St. Patrick is the patron saint of engineers. March 26 Paul talked on bearings for the sixth year for engineers' day at Oklahoma Agricultural and Mechanical College. March 27-April 2 we visited our former home, Valparaiso, Ind. May 9 we went to the meeting of the Oklahoma Society of Mayflower Descendants, at Tulsa. August 21 Paul's name came out in 'Who's Who in the Southwest.' October 10-13 we went with a busload of Kiwanians to Galveston, Texas, for the Oklahoma-Texas district convention. In November Paul drove to Binger with a group to look over a boys' camp his Kiwanis may take over. December 3 he was elected illustrious master of Alpha Council of Royal and Select Masters for 1960 here." This covers only about a third of the wonderful letter written by Otilie, who said: "Since Paul is mentioned with such frequency, you would know he did not write this." She also wrote: "We think often of our friends; hope they are well; and are always glad to hear from them at their leisure." Their address is 1212 Marlboro Lane, Nichols Hills, Oklahoma City 16, Okla.

Simon Nath, V, of Thornton, N.H., formerly of North Chelmsford, Mass., died last November 7 at the Mary Hitchcock Hospital, Hanover, N.H. The death notice in the Lowell, Mass., *Sun* says: "He will be remembered in Lowell for his work as a chemist at the Lawrence Manufacturing Company. He is survived by four daughters, two sisters, a brother, and 11 grandchildren."

A card from Philip Caldwell, I, and his wife Bobby showed their new address as Route 1, Box 100, Nokomis, Fla. He formerly resided in Wilton, Conn. . . . The following additional address changes have been received: General George C. Kenney, I, 10 Columbus Circle, New York 19, N.Y.; Edwin Pugsley, VI, P.O. Box 396, Monticello, Fla.; Ralph A. Holbrook, X, 6 St. Johns Road, Ridgefield, Conn. — HENRY F. DOLLIVER, *Secretary*, 10 Bellevue Road, Belmont 78, Mass.; JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## '12

The following is taken from a newsy letter from Johnny Noyes who is back in Texas after a five months' trip around the country. He and his wife spent three months on the coast of Maine and returned via Canada, Lake Superior, and Duluth, Minn., where Johnny was formerly with the Joy Manufacturing Company.

In Duluth they had a pleasant visit with Don and Kate Radford. Don has retired and does a great deal of traveling. His address is 2916 East First Street, Duluth 5, Minn. Johnny's first project was to get in touch with his children and grandchildren which took him to Bryan, Houston, Corpus Christi, and San Antonio, Texas. They pushed on to Austin for Thanksgiving.

They have six children, five living in Texas, and 12 grandchildren. In Houston they had a pleasant visit with Holman and Hazel Pearl. You will all remember Holman who was editor of the *Tech*, in our time, and who also put on the famous minstrel show the "Chocolate Soldier." Holman has retired from Hollingsworth and Whitney and spends his time with his four children and his garden as well as collecting coins and stamps. He would welcome any correspondence regarding either stamps or coins. His address is Holman Pearl, 708 Mulberry Lane, Houston, Texas.

On the way East last June, Johnny spent two happy days with Colonel Harold C. Mabbott and his daughter at their home in Swarthmore, Pa. Harold is interested in the local Little Theatre Group and also does some lecturing at Swarthmore College. His home address is 417 Harvard Avenue, Swarthmore, Pa.

While in the East Johnny attended the two-day Third Alumni Officers' Conference at M.I.T., posing as an "honorary secretary in residence." Two other 1912 men were there, Harold G. Manning of Waterbury, Conn., and Albion Davis of Wellesley. Johnny was able to see Albion's new home, beautifully situated in wooded country with birds and flowers on all sides. Albion's address is 38 Sabrina Road, Wellesley 81, Mass. Your secretary wishes some of his other old friends would write such an interesting letter as Johnny did for the enjoyment of us all. — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston 8, Mass.; JOHN NOYES, *Assistant Secretary*, 3326 Shore Crest Drive, Dallas 35, Texas.

## '14

When in the January issue of *The Review*, your secretary told of the hazardous trip of Alden Waitt flying over the Himalayan Mountains, he chanced the remark that the next time he heard from Alden he would be making his mark in the field of art in San Antonio. Having known him since preparatory school days this was not just a chance remark. Have you seen the March-April leaf of the *Motorola* calendar? The landscape is by the brush of Alden. Since his return to San Antonio two of his paintings have received national attention, one having started on a tour of national exhibitions. Just to take up his spare time he has been made impresario of a series of three plays to be put on in San Antonio. Such actresses as Ann Sheridan, Joan Blondell, and Miriam Hopkins are taking the leads. He is already planning to come up to Cambridge for Alumni Day. A lot of pep for a retired major-general.

Dean Fales missed his trip to Florida to judge the Sebring Races. The old gout caught up with him again. He has sent your secretary a photograph of his latest invention, a goutmobile. It consists of a wheelbarrow with a pillow on it upon which his right leg rests. I wonder how Dean pushes the buggy upstairs. . . . John Burdick attended our 45th reunion in not too good health. A month later he entered the hospital for nearly four months because of ulcers on his left leg.

He is now home again and hopes that in a short time he will be back in fine shape. Jack has already retired from Brown and Sharp in Providence.

Just as these notes were being prepared word was received that Matthew Harrison has moved away from Oakland, Calif., where he had been for many years. Has he joined our large group of those who have retired? It would be a real help when sending in an address change, if the reason is retirement, to note it. It will be recalled that Bob Patten had retired from the Hot Point Company in Chicago and had moved to Bradenton, Fla. He too had a stay in the hospital in December. He is again home and his classmates all wish him a speedy recovery.

Have you responded to Herman Affel's appeal for the Alumni Fund? He would appreciate hearing from you if you have not sent in your pledge card. M.I.T. needs your help! — HAROLD B. RICHMOND, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass.; CHARLES P. FISKE, *President*, 4801 East Broadway, Tucson, Ariz.; HERMAN A. AFFEL, *Assistant Secretary and Class Agent*, R.F.D. 2, Oakland, Maine.

## '15

Wonderful — what a class! On Friday night, January 15, at the Chemists Club in New York, 23 classmates and Gerry Rooney, U.S.M.C., gathered for our annual dinner there. It was the usual gay, pleasant time, enjoyed by all. Larry Landers and Bur Swain set it up for us and received a resounding vote of thanks for their work. After an hour of cocktails, followed by an enjoyable dinner, we discussed class affairs, personalities, old times, and the coming 45th reunion in June. A show of hands indicated that everyone present will be at the reunion. Go, thou and do likewise! Let's make this the BIG one!

Twelve of us have retired and seem to be enjoying it. We all missed Ben Neal who wired that, because of the weather, he could not fly from Lockport. Ray Walcott continues his devoted job of welcoming '15ers to the class lunches in New York. Regular attendees who could not make it wrote: Phil Alger said Hen Berg and Earle Brown will be at the reunion, all the way from the Pacific Coast. Bill Campbell was away. Ralph Waterman was in Europe. Harvey Daniels, Vince Maconi, Forrest Purinton, Larry Quirk, and Cliff Sifton were away — most of them in Florida. Jim Tobey wrote he is suffering on the platinum coast of pirate land in West Palm Beach with a few days in Nassau and the Bahamas thrown in.

After dinner over half the men stayed on for an old time college-days session in our suite upstairs. It spread a warm feeling for these fine old friendships that seem to get even better as the years roll by. We signed and mailed "get well" cards to Herb Anderson and Larry Bailey with our sincere wishes for speedy and complete recoveries. And we signed a note to Barbara Thomas — a great friend and always interested in class activities. She and Al Sampson will set up the class cocktail party on Alumni Day. The surprise of the evening was Johnnie O'Brien, whom we

had not seen for a long time, and whom we were glad to welcome back into the fold. Come again, Johnnie! It was a pleasure to have George's son, Gerry, with us. Surely a handsome Marine.

Long distance honors went to Bill Spencer from Baltimore. Wayne Bradley and Alan Dana came from Connecticut and Sam Berke from Lakeville, Conn. Dick Bailey, Henry Daley, Sol Schneider and Ed Whiting came from Philadelphia. Present were: Dick Bailey, Sam Berke, Bill Brackett, Wayne Bradley, Jerry Coldwell, Alton Cook, Henry Daley, Alan Dana, Larry Landers, Azel Mack, Hank Marion, Johnnie O'Brien, Gil Peakes, Wally Pike, Pirate Rooney, Gerry Rooney (U.S.M.C.), Sol Schneider, Frank Scully, Bill Spencer, Bur Swain, Ray Walcott, Speed Williams, Ed Whiting, and Chris Wolfe.

Late that night Ed Sullivan and his sister, Anne, sailed from New York on the "Bergensfjord" for a three-month round-the-world cruise. Bon voyage to them and we'll be anxious to report their travels. . . . Herb Anderson has had a serious eye operation and was in a Philadelphia hospital for a long siege and may have to have a second operation later. I phoned him at once and he sounded cheerful and encouraged. . . . Henry and Frances Daley, upon their return from a month in Florida (down to Miami and up to St. Petersburg), got in touch with Herb and Alice and wrote: "I talked with Andy today. The two eye specialists he has consulted both agree an operation is necessary, but disagree on the methods or scope of the operation. Andy told me that he is going to New York the week of January 3 to see another eye specialist, and if the latter is in general agreement with the other two, then he will be operated on in New York by the latter. Apparently he has a detached retina. I gathered from our talk that the specialists to date have not been able to determine exactly what is wrong or what the next move is. That is why he is going after other advice. I trust, and we all do, that they will come up with the right answer. We talked for nearly a half hour and he was just as peppy and optimistic as ever. I will contact him or Alice later and let you know if there are any new developments. He did say he hoped he might be able to make the New York dinner in January, but admitted he was just whistling in the dark."

Larry Bailey is home and doing well and says: "I am still far from 100 per cent or whatever per cent we are supposed to be at our age!" . . . Ken Johnson was in a Providence hospital with bronchial pneumonia after which Esther was laid up with an infected hand, but Ken wrote "both our elbows are O.K." With such a sense of humor, we know they'll both keep healthy.

Thayer MacBride is convalescing slowly at home from recent surgery. . . . Loring Hayward says: "I am getting around a little, but not tearing the world apart yet." To all these men and any other classmates not "feeling 100 per cent," go our best wishes for speedy and complete recoveries. . . . Ray Walcott was good enough to send this list of '15ers at the annual dinner of the M.I.T. Club of New York at Hotel Biltmore, December 2, 1959 — Jerry Coldwell, Warren Cowles, Jack Dalton, Frank Scully and Ray Walcott.

Christmas cards from 60 classmates scattered all over the country warmed our hearts. Here are some of their interesting messages. Ruth Place, Pasadena, Calif.: "My 13½-year-old grandson, Peter, is living here with us now and it's wonderful to have him. When do we see you out here?" . . . Phil Alger's poem gave an outline of his European trip last summer. . . . Bur Swain: "Joanne and I have been on the West Coast for the holidays with our three grandchildren, whose mother is our daughter." . . . Virginia (Thomas) Johnston, Princeton, N.J., invited us down to see them there. . . . Chet and Margaret Runels, Lowell, Mass.: "How about a trip to Lowell and a little get-together one of these days. Our three daughters, their husbands, and 11 grandchildren are divided between Albany, N.Y., Wilmington, Del., and Laconia, N.H. At holidays our house bulges at the seams."

Doug and Elizabeth Baker, East Middlebury, Vt., renewed their invitation for another visit next summer. . . . Maurice Brandt, Salisbury, N.C.: "Our reunion in June is naturally occupying our attention and, as usual, I expect to be there. We are planning to move into central Virginia, where our son is a lawyer."

Ray Stringfield invited us out to beautiful but smoggy Los Angeles and then wrote: "Our little rubber business pecks along quite nicely, but in common with most businesses, every time you turn around you need a new press or chopper or something, so you don't dare to raise your income too much or you won't have any cash left. On top of that, we are getting so crowded that we need a new location badly. Actually our primary need is for about a million of those green things."

"Bob Welles and I continue our activities with the M.I.T. Club of Southern California. He was chairman last year, or I should say president, and continues on the Board, and they drafted me as vice-president and program chairman this year. We have around 2000 Alumni in southern California, but they are scattered so that it is always hard to get out a big crowd."

"Court cases involving tires, gasoline hoses, and other rubber and plastic troubles continue to keep me as busy as I want to be, and what with both sides trying to get me as an expert, and attorneys scheduling two cases on the same day, we have lots of fun. Two weeks ago, had one case in Long Beach and another in Burbank, some 50 miles apart, at the same time, so spent three days vibrating between them at 75 m.p.h. on the freeway. Have a big patent case coming up in January which I trust will help the government out with my income tax. Our smog is terrible at times, but come on out anyway as it is only here about a third of the time and we can go out to the desert if we need to and get some fresh air and sunshine."

Alan Dana, Seymour, Conn.: "To go Jules Verne one better, I flew around the world in 40 days last spring. I was in Honolulu, 10 cities in Japan, Bangkok in Thailand, the island of Macao, Hongkong, Calcutta, Agra, Banares, Delhi and Bombay in India, Cairo and Luxor in Egypt, Beirut and Baalbek in Lebanon, Istanbul in Turkey, Athens in Greece, and Rome, Zurich, and Paris on the way home. It was great to see how other people live."

"My middle son graduated from M.I.T. in the pre-medical course which few seem to know about. It is Course VII, quantitative biology. He was accepted at Johns Hopkins, thanks to Tech perhaps, and now is a doctor, interning at Grace-New Haven Hospital, a part of Yale. He is married and has a two-year-old daughter of M.I.T. quality. I guess this brings us up to date." A granddaughter of 1915 as an M.I.T. student would establish some sort of record.

On January 10 Fran and I attended a tea at the Wellesley Inn, Wellesley, Mass., announcing the engagement of Bill and Marje Brackett's granddaughter, Janice Hanley to Bill Woodcock. Now, this may eventually establish Bill and Marje as the first great grandparents in the Class. How about it—any contestants? . . . Alice Chellman was in Boston during the holidays and visited with us and some of her old class friends, including Barbara Thomas, the Pikes, the Woythalers and the Rooneys. We were all glad to see her up here from Wilmington, S.C.

During the holidays, I had lunch with George, the Pirate, Rooney, and his 19-year-old son, Gerry, home on leave from his Marine Corps duties at Annapolis. With more free time now available, Fran and I plan to visit these distant classmates who are always so cordial with their invitations. We'll eventually get to the West Coast. More Christmas card messages for you next month. Meantime, make your definite plans for our June reunion, the 45th—it's getting late! Be there with the rest of us. We have no details of the deaths of two classmates, William Jennings, Salt Lake City, Utah, July 6, 1959, and Samuel M. Fox, Jr., Pemberton, N.J. The sympathies of our Class go out to their families.—AZEL W. MACK, *Secretary*, 100 Memorial Drive, Cambridge 42, Mass.

## '16

How number conscious do we get? Ralph Fletcher forwarded to us the coat check handed to him when checking his coat the day before Christmas. The number? You guessed it—16! And now, once again, here's a message from Ralph: "There are a couple of items that I would like to present for your interest. The first is a reminder of the forthcoming 44th reunion which will be held on June 10, 11, and 12, 1960. Remember the reunion dates and plan to attend. The other item is the class treasury. I can't remember when it was that we last sent out a general call for a contribution to the class treasury, but now, after many many years, we find we must have a little help to cover the expenses incidental to the various mailings for The Review column, the Alumni Fund, and other class activities. We are confident that everyone will want to share in this, and because we look for a near 100 per cent response we feel that we can limit the amount to \$5.00 per classmate. Send your check to Hovey T. Freeman, Treasurer, Class of 1916, P.O. Box 1485, Providence, R.I.

Many Christmas cards were received with pleasure. Don Webster says nice things about the notes and the activities of Ralph

Fletcher and Jim Evans in keeping the old Class pumping along. Says he knows some of the problems for he had the secretarial job way back when everything was younger. . . . Jap Carr came back from Florida for the holidays in Wilkesbarre and Buck Hills Falls. In early October he and his wife flew to Texas to meet their younger son's in laws; son is in the Navy and was on leave there. In mid-November they drove to Florida where their older son has settled and started an automatic car-wash business in West Palm Beach. Jap is now in semi-retirement "mostly consulting and providing initial financial sinews." Back in Florida since January 6, he'd like to see any Florida traveling classmates: address, 260 Pendleton Avenue, Palm Beach, Phone TE 3-4312.

George Sutherland writes from Arizona: "Had a slight stroke a couple of years ago and have been loafing in Woodbury, Conn., ever since. On December 1 we came out to Phoenix to absorb some of their advertised sunshine and will be here (1516 East Rorey Avenue) until April 1, when we will go back to Woodbury for the summer." We're glad to report that George is now "practically back to normal." . . . Theron Curtis says there's nothing very important about his activities. He has been semi-retired for two years and is at present on a consulting job with Hovey Freeman on modernizing the Turks Head Building in Providence. He has seven grandchildren.

Dina Coleman in Lexington, Ky., mentioned in November that, with 5000 additional children in his district, who will be knocking on the school doors at the rate of 1000 per year, the voters turned down a request for money to build the necessary classrooms and to hire the teachers to staff them. He says: "Part of a general reaction against more taxes is the only rational explanation. Next year we will eliminate practically everything from new buildings except the bare walls, floors and roofs of classrooms. No cafeterias, gyms, home economics, vocational training—and we may have to increase the walking distance to one and a half miles in built-up areas. A sausage between halves of a biscuit will make its reappearance. The three R's will again become familiar to school children. What a surprise that will be to one and all!" As mentioned in last month's notes, Dina is chairman of the finance committee of Transylvania College, a college which in 1959 took the positive step of complete independence of all present and future federal aid, by disassociating itself from the National Defense Education Act of 1958. Regarding his work with Transylvania, Dina says: "It is a pleasure to work on an executive committee composed of level headed business people and a president who is not money mad on the subject of new monumental buildings."

George Maverick, a professor for three years now, writes that he's had so much more fun than he expected since retiring, that he feels he ought to tell about it. He spent 33 years with Esso Research and Engineering Company and "a better group can't be imagined." He and his wife had planned to retire early to his old home, Sunshine Ranch, outside San Antonio. However, they were building up a camp-like sort of place on the edge of Charlottesville, Va., when in 1955 the University of

Virginia started a new graduate school of business administration. George says: "During the first year they let me help as a visiting professor and, in the fall of 1956, I retired from Esso Research to move here and become a professor at the graduate business school. I have continued to represent Esso Research in some committee work in Washington. Here I give a course in employee relations by the Harvard case method. This is a far cry from the chemical engineering I had at M.I.T. The stuff about an old dog not learning new tricks is wrong, but it's not very wrong. I haven't worked so hard for years, or had so much fun doing it. The school is a new venture with a young faculty working like the dickens to make itself into a top grade outfit that will help southern business. The younger professors seem to be glad to have us and include my wife and me in their joys and worries. It is like starting to work all over again and certainly there can't be a happier form of retirement. I hope I can stay until I'm 70. Lots of people seem to have caught on that the ideal place to retire is a small university town. Charlottesville is certainly one of the best of them and, in addition, both Ruth and I have many relatives and friends here. Starting with a small piece of woods, we have spread out more than we had planned. A small house for us, another for visiting friends, children, and grandchildren, a big pond to swim and fish in, and so forth. We have never stopped building. Ruth specializes in gardening and I on chain saws and tractors." George expresses the hope that any of the classmates coming through will stop at Shepherd's Hill Farm, which is only a mile and a fraction south of Charlottesville on Route 29. Their name is in the telephone book but they have had to take it off the gate "because of the hullabaloo over Bret and Bart on T.V."

When we heard in October that Aimé Cousineau was on his way to Europe and was to have a short stay in Lisbon, we airmailed him a letter via his office in Montreal, telling him to be sure to call on Joao Correia in Lisbon who is always most anxious to meet any '16er who visits his city. Aimé says he never got the letter which he regrets, for he sojourned three days at the Tivoli Hotel in Lisbon and visited the Canadian Ambassador who is a good friend of his. He was away from Montreal 80 days, enjoyed the voyage very much, and in all traveled in 12 different planes. For the benefit of any '16er going to Lisbon, please jot down Joao's address in your pocket notebook: Rua do Alecrim, 29, Lisbon, Portugal.

We have further bits regarding the safari of Vert Young and his wife last summer in southern Tanganyika. Speaking of the greater kudu, Vert says: "These lovely large antelope inhabit hilly country and at night move down into the flats where the natives live, to browse on the leaves (I hope!) of their castor bean plants. (What the natives do with all the castor oil they raise I cannot imagine.) So you climb a rocky outcrop 300 to 600 feet high and glass the country until you see an ear twitch or a tail brush a fly. Then the stalk begins, lasting half an hour up to two hours and more silly things can happen to spook a kudu or cause him to alter his

plans. They happened to me or my kudu candidate. Finally, early one morning, we were stalking a herd of waterbuck on one of those long encircling movements like Hindenburg's at the battle of Tannenburg, when we flushed a kudu out of a thicket and had our one chance — and made it, after six fruitless stalks. It is a glorious trophy with beautiful spiral horns that run up to 60 inches in length. At 51 inches, mine was still a good one." At Camp 4, Vert finally got a fine buff, 46 inches spread of horns, but says that the most humiliating moment of his safari was when, in his excitement, he pulled both triggers at once on a .470 double barreled Rigby rifle — and missed: "We trailed him further and I had one last chance with my last cartridge. If I had missed that shot, poor Sylvia would have been a widow." Vert says he turned 66 on July 17 and: "Sylvia felt badly because she had no birthday present for 'poor old Poppa.' Then she spied an enormous warthog — at 200 yards. 'This,' thinks she, 'is almost like giving Vert a portrait or a statue of himself,' so she ups and ats 'im and boys, they are darn good eating!" Vert says they got all the game they hoped to get and some besides. The problem still unsolved is what to do with the 8 or 10 trophies. As he puts it: "My study already contains a moose and a caribou head, so it looks like another room must be added, or better still, a new log cabin on the premises to house both my trophies and my minerals collection. It reminds me of the story in 'To Hell with Fishing,' of the fisherman who didn't like fish and after exhausting the fish receptivity of his friends, they bought him a fine walrus to eat the weekly catch. However, when the walrus died from overeating, he discovered that walrus disposal was a worse problem than fish disposal." Vert winds up by saying: "Africa is a wonderful country — go while your legs hold out."

Jim Evans says a card sent to Irv McDaniel in California was returned by his daughter, Mary, telling Jim that Irv and his wife went to Europe in June '59, and that they may not come back for two years — in fact, with the fun they are having "they may never come back!" She adds: "True gypsies — the Navy didn't begin to cure them!"

Harry Lavine reports something unusual, back in December. He writes: "Strangely enough, yesterday, for some unaccountable reason, I kept thinking of Donald Webster all through the day and behold, the following day I received this fine photograph from you showing the members of our Class who attended the Chatham Bars Inn reunion last June. Needless to say, his face served to complete that which was incomplete." Harry retired from Equitable Life in August, 1958, but is really only semi-retired for he continues with individual sales, something that is possible in the insurance business. He finds that he has been away so long from the elements of chemistry (he took Course X) that he has given up the idea of going back to teaching at some neighborhood group on a voluntary basis. He has three grandchildren. His son, Dick Davis, with the A.M.F. Company, is responsible for the Freepoint Bowl at Freepoint, L.I., which has 44 lanes, and will complete the opening

of two other spots before 1960 is over. Harry says further: "My good wife, aside from her many activities at our temple and in the community, is teaching a class how to transcribe the printed word into braille for the benefit of the blind. I wish I had her zeal, for this virtue knows no barriers as far as she is concerned."

Arvin Page had a number of interesting observations on things he and his wife saw in the far West during their four months' auto tour last spring. On driving north from San Francisco: "Checked in at a motel in Redding, Calif., in the foothills, after driving for miles with snow-capped Mt. Shasta directly in front of us. We had dinner that night in a restaurant connected with the motel. It was the most outstanding dinner we have had so far. They specialize in roast beef with one other choice of entree — the dinner is buffet style at \$2.75 per head. To begin with the chef cut me a slab  $\frac{1}{2}$  to  $\frac{3}{4}$  inches thick of the most beautiful red roast beef I ever saw and it tasted even better. Then I went back and got another slab of like proportions at no extra cost. The same quantity of meat at home would have cost me \$6.00 or \$7.00 and I have never had equal quality anywhere. I shall always remember that meal. For anyone passing this way I recommend they pause for dinner, vegetarians excepted." In Portland, Oregon: "After lunch we drove over most of a scenic route. Most interesting to us were the miles of residential streets lined on both sides with the most brilliantly colored yards we had ever seen. There were all shades of flowers from white to deep purple, even a few black tulips. Words are inadequate to describe this sight. Portland likes to be known as the 'Rose City.' We, of course did not see the roses — it was about a month too early — but I do not believe the color effects at the height of the rose season can even approach what we did see. In Oregon I saw the first white birch tree I have seen since I was last in New England, and the first Scotch broom I ever saw growing wild. It sure does grow wild, everywhere — like a weed — in fields, in gravel pits, on rocky cliffs. The bright yellow color certainly enlivens the landscape — acres of solid bright yellow." In Yellowstone: "June 1, into the Park — bears along the road every mile or so begging for food — singly and in families. Even though 39 persons were seriously clawed by bears last year and repeated warnings are given by the Rangers with strict orders to refrain from feeding the bears and to stay in the car, at least half the tourists throw food to them and get out of the car to take pictures." He mentioned that the most interesting feature of the wildlife in Yellowstone Park was the large number of sea gulls in the neighborhood of Old Faithful. On Pikes Peak: "For anyone seeking a thrill I can unequivocally recommend a ride down Pikes Peak with a driver who is in a hurry. The dirt road, just wide enough for two cars to pass, is a series of hairpin turns for five or six miles. It extends out from the side of the mountain 14 feet or so and beyond that is nothing but air — no guard rail or wall of any description. For anyone who can take their eyes off the road there are some gorgeous views. Just as we left the steep part we had a blow out — very glad it waited!"

We are indebted to Andy Fisher '05 of Roxbury, Mass., for an interesting letter which he opens by saying the 1916 notes "are the most interesting of the bunch." More important, however, he calls our attention to the fact that Frank Hastie has a mighty fine son, Neil, who is pastor of the St. James Episcopal Church in Roxbury. He reports: "He has a Volkswagon station wagon and he lugs about 16 kids of all races and creeds into the country for weekends. He takes old people out too! One of his parishioners is an old lady whom we have known for a long while, and one day he brought her over here. My wife happened to mention that my daughter would probably be glad to help him with his work with the boys. She has 50 acres up in New Hampshire and sure enough, Neil took us up on the proposition and Edith's farm is one of his weekend objectives." Mr. Fisher suggests we might like to write to Frank that we hear good news of his son, Neil. This we have been very happy to do. Frank writes back that both he and Neil's mother were very happy to hear such kind words about their son, who they know "is really dedicated to his work." Frank is just getting settled in Dowell (Calvert County), Md., on three and a half acres, with a frontage on St. John's Creek which runs down into Solomon's Harbor. So far he's done no fishing or boating but hopes to later this year. He's expecting to make the 45th in 1961 and is looking forward to seeing some of the old gang again.

Ted Strieby is now in his fourth year of retirement from Bell Labs and A.T. and T. and finds it a pleasant way of life. During this time he and his wife have traveled a bit — Spain, Italy, Greece, Switzerland, Mexico, Guatemala, some of the Caribbean islands and some of the U.S.A. He is also doing some part-time consulting in communications engineering, which he says helps the exchequer and "perhaps slows down the natural process of mental and physical decay to which we are all subject." For many years they have vacationed in Vermont and now — hear, hear — they can stay two whole months. This is one of the most significant features of retirement — two months, six weeks — none of that three or four week stuff! During vacation they can have a good visit with their daughter and two lively grandsons (they live in Cambridge where son-in-law teaches music). Son Michael, Ph.D., M.I.T. '55, is with Hughes Aircraft and lives with his wife and Ted's only granddaughter in Los Angeles.

Vannevar Bush is practically always in the news. This time we can report that, early in January, we received the following note from Alumni headquarters: "*The Teaching of Human Relations* (by the Case Demonstration Method) by F. Alexander Magoun '18, with a foreword by Vannevar Bush '16. This 169-page book is priced at \$4.50 by Beacon Press, Beacon Hill, Boston."

In conclusion — letters have also been received from Spotts McDowell and Larry Knowlton; these will be reported in the next issue. Many thanks to those who have responded to the requests for news. The more we hear from, the more we hear. The interim standard do-it-yourself test is again proposed: if you haven't been quoted in

the last six issues, please consider yourself due. — HAROLD F. DODGE, *Secretary*, 96 Briarcliff Road, Mountain Lakes, N.J.

## '17

Since the class notes this month will be not much more than a few random notes, you may be interested in a statistic. During the year 1960, 83 members of the Class celebrated their 65th birthdays. How about a flood of letters to the secretary about plans for the next 25 or 30 years?

Enos Curtin is active as usual. He writes: "I went fishing in Alaska last summer and had a wonderful time. The scenery was gorgeous. Prices, however, were sky high. A haircut cost \$3.50 with a 75¢ tip. A 60¢ New York breakfast cost \$2.60. I did not do any hunting in Alaska, but I recently went wild pig hunting in Palm Beach County, Fla., without bringing home any trophies. I was recently elected president of the National Society for the Prevention of Blindness, which has been in existence for 50 years and has chapters in most states." In addition to directorships in several hospitals, Enos is chairman of the board of the American Field Service which arranges for about 1000 exchange high school students from 30 or 40 countries each year, including the U.S.

If you want to learn about "The Controller's Contribution to Cost Reduction" by W. Joseph Littlefield — the new research director of Controllars Institute Research Foundation, New York — get a copy of the December 1959 copy of *The Controller*. . . . Dix Proctor and wife are off again on another winter vacation. Dix writes: "We leave on January 7 for Vancouver and San Francisco to go aboard the S/S Monterey of the Matson Line for "down under," stopping at islands en route to and from Australia. We expect to spend a month in Australia, Tasmania, and New Zealand, and shall be back in the States early in April." . . . Tubby Strout has bought the general store in Amherst, N.H., which is in the southern part of the state not far from Nashua. Tubby says he would welcome suggestions for a name for the store. Besides the store, he is fixing up living quarters and hopes to be all set before too long.

A private eye on duty at the St. Botolph Club in Boston recently sent in the following report: "I spotted a group of 1917ers eating lunch in a private room at the club. There was Lobby for one, and Bill Hunter for a second. A white haired guy looked like Stan Dunning, but turned out to be Loosh Hill. (Dunning parts his hair in the middle, while Loosh parts his on the side.) A fellow sans hair was Ray Stevens. There was little chance to listen in on their conversation, but I did hear them mention the 45th reunion, and say something about the Alumni Fund. The luncheon did not appear to degenerate to the story telling stage." By the way, the secretary would welcome any favorite jokes — suitable for publication — that you would like to share with the rest of the Class through the notes.

Brick Dunham decided to retire from the Lewis Shepard Company, on December 31, 1959, and devote his time to portrait

painting. . . . One of today's best smiles reads as follows: While crossing the campus, a freshman ran into one of his English instructors, and for want of something to say, exclaimed: "What's your guess about the football game next Saturday? You don't think we'll do bad, do you?" "Don't you mean badly?" the instructor said. "Whats the difference," the freshman said, "you know what I mean." "An 'l-y' can make quite a difference," the instructor said. He pointed to a passing co-ed. "For instance, it makes a difference whether you look at her sternly or at her stern." — W. I. McNEILL, *Secretary*, 107 Wood Pond Road, West Hartford 7, Conn.; STANLEY C. DUNNING, *Assistant Secretary*, 21 Washington Ave., Cambridge 40, Mass.

## '18

Life has often been referred to by novelists, poets, and adage makers as a journey. For example, there is the beautiful hope, if properly understood, which reads, "In your journey through life may you never meet a friend," or "Life's a voyage that's homeward bound," or "To travel hopefully is a better thing than to arrive." Ed Little, who got a bachelor's degree at Yale before topping it off with another in Electrical Engineering, served as an engineer with American Tel. & Tel. at 195 Broadway, New York. Forsaking the broad ways last March 10, he and his neighboring New Jersey Friend, Murray Chism, walked the whole length of the Appalachian Trail from Mt. Orgelthorpe, Ga., to Mt. Katahdin, Maine, a distance of over 2,000 miles. They reached the summit of Katahdin on November 8 over the ice and snow covered bolders of the Hunt trail, thus becoming the eighth and ninth persons ever to complete this arduous, back-packing hike in one continuous effort. It took one day short of eight months. Most people do not have that much time until after they have retired, and then only the fit and the courageous are willing to even think about it.

Ed says: "Mrs. Little drove the automobile, which was heavily laden with the dehydrated and special foods we used and much spare equipment. It would have been impracticable to have picked up these items at local stores along the way. She met us at some of the points where the highways cross the trail. This was at intervals of from four to seven days usually. She would take us off the trail at these points so we could repack our food and clothes, and then put us back on the trail at the same point we left it. We carried Kelty packs, which weighed between 38 and 50 pounds each, the weight depending on the amount of food and water we were carrying at the time. Each carried a one-man tent which provided complete enclosure. These were quite necessary in parts of the trail where there are no leantos. Bad weather was our worst problem, and those eight months certainly were poorer than average. We had extremely hot weather part of the summer. All but a few days of the entire time we were in Maine (nearly a seventh of the whole trail) we had either rain or snow during some part of the day. Add to this the fact that

there were several days, or rather nights, when the temperature was below 18 degrees, and it is quite just to say that Maine certainly threw the book at us. I lost between 15 and 20 pounds in the first few weeks and did not change much from that till the cold weather hit us, when I put some weight back on. We had no foot trouble throughout, but the soles of our feet ended up about as tough as sole leather though not quite so thick!

"Special adventures? Well, we were caught midstream on a railroad trestle by a freight train in Tennessee. Yes, we had room to crouch on the superstructure with sufficient clearance. The trail was routed over the trestle, but since has been re-routed to avoid that means of crossing. And we killed three rattlesnakes and one copperhead, all of them directly on the trail in position to be stepped on in a couple more steps. We carried a suction snake bite kit and cortisone (as a shock preventative) in our very complete first aid kit. On the happy side we were surprised by a roast turkey, green beans, salad, muffins, coffee, and watermelon banquet brought to us at our leanto by members of the Potomac Appalachian Trail Club. And my partner's two sisters brought a picnic lunch to meet us with when we were close to their Philadelphia homes.

"I might mention that quite contrary to the usually accepted camping practices, we did *all* of our cooking (we had hot food at each of the three daily meals) on a small single burner gasoline stove of the Primus type (a Svea). Also we used a two-and-a-half-quart pressure cooker. The handles were sawed off to short stubs to save weight and make stowing easier. In it we not only prepared our evening meal's hearty stew, but we were able to use the bottom half as a shallow cake pan to bake a muffin mix or a bannock each evening. Half of the muffin or bannock was eaten for supper the other half the next noon. The stove and pressure cooker saved untold hours of cooking time and gasoline. When it was raining outside the leanto, as it was far too often, and the wood was too wet for any fire building, we were mighty glad not to have to use an outside fire." My guess is that Mrs. Little had a small trailer to sleep in. Be that as it may, all of us who, when we had more wind and less girth, scampered barefoot across a dewy field of a summer's morn, salute all three of these people for so exhausting and glorious a human experience, especially at an age when men have retired from what usually goes by the name of active life. No one prizes life more than the man who has a sense of achievement in going somewhere! Bravo Ed and Alice — the big Littles.

Bill Wyer, traveling a path that of necessity simultaneously endeavors to fight and to win, testified in Washington last fall (news reached us by courtesy of Carole A. Clarke, secretary for '21) that the merger of the Erie and Lackawanna Railroads would have no adverse effect on shippers or the general public, but would create the 12th largest railroad system in the country. As a result of the detailed study his firm made of the proposed merger, prepared at the request of the Erie and the Lackawanna, he testified that the merged line would retain almost seven million dollars worth of

business now turned over to other railroads by the Erie and Lackawanna. In return, he has said, other railroads would divert almost six million dollars worth of business from the merged line. He was cross-examined by attorneys from four railroads at an Interstate Commerce Commission hearing. The Nickel Plate, Wabash and Lehigh Valley roads are opposing the merger. The New York Central, although not opposed to the plan, has intervened in the case.

A few side journeys in these notes include a greeting from Fred Philbrick in which he says life is pleasant and the Florida weather to his liking. The revolution in Cuba and the loss of a few teeth concern him some, especially the former. Refugees give him the impression that there is a bad snarl to untangle which should be accomplished without outside interference. . . . A neighbor who occasionally travels to Lawrence, brought me greetings from Byron Cleveland, with whom the neighbor has business dealings. Byron is president of the J. N. Horne and Sons Company which manufactures paper making machinery. Considering the sturdy attributes of integrity and vision which said neighbor ascribed to Byron, his ears should be rosy despite the cold weather.

In order to multiply the places to which his influence can travel simultaneously, F. H. Norton co-authored an article with S. F. Brown '23, entitled "Constitution of Copper-Red Glazes." It appeared in the November issue of the *Journal of the American Ceramic Society*. . . . Finally, courtesy of Harold Dodge, secretary of the Class of '16, comes news that George Brewer is occasionally seen in Erie, Pa., by other Alumni. With that teaser I now flee with our dog for a walk in the cold snow storm of this January night.—F. ALEXANDER MAGOUN, *Secretary*, Jaffrey Center, N.H.

## '19

In answer to my request for information, Jim Hawkes paints a beautiful picture of his life in Bejuco in the mountains of Panama: "Ideal weather all year. Living fairly cheap. Tenderloin 35¢ per pound, scotch \$2.50 a bottle. Other commodities reasonable. All the luxuries I desire in the city of Panama, only 50 miles away over concrete highway." We can understand why he says he is enjoying retired life. . . . Robert Montgomery writes that he has been retired for six years, with the last four spent in Florida. His hobbies are gardening, golf, and meetings of the University Club and Spanish Society. He lives in Winter Park.

Ed Moody says that fellows our age have nothing to report but projects for their grandchildren, and then goes on to list a long paragraph of activities, somewhat removed from grandchildren. Besides actively designing and building oil trucks and fire engines, he is president of the New Hampshire Folk Federation, and chairman of the 1960 New England Callers-Teachers and Leaders Folk Conference; attends at least one good old-fashioned dance a week, generally as a dancer but sometimes as a caller; and also does some research and writing on

folk dancing, for several publications. . . . W. Roy Mackay writes that he is anticipating retirement in about three years. He is associated with the Bethlehem Steel Corporation, Sparrows Point, Md., an association which he has found very pleasant in the last 37½ years. He is presently superintendent of the Rod, Bar, Wire and Wire Products Mills.

Stuart Hayes writes: "A few more years; a few more pounds; considerably less hair; nothing drastic has happened; children all married—happily; nine grandchildren." . . . Dick Holmgren is in San Diego as general manager and chief engineer of the San Diego County Water Authority. In this capacity he is trying to keep a rapidly growing area supplied with water. Under his supervision the Authority is just completing the construction of a \$55,000,000 aqueduct to obtain water from the Colorado River aqueduct. When this is finished he hopes to take a good trip, the last one being a visit to Hawaii.

Don Kitchin and Orison Pratt '41 won first prize from the American Institute of Electrical Engineers for their article "Treeing in Polyethylene as a Prelude to Breakdown." . . . Through the M.I.T. Alumni Office, we have heard from Bill Banks, A. Stuart Kelsey, Howard H. McClintic, Jr., and Captain Edward E. Saunders. . . . Will Langille writes that he can procure additional copies of the group picture taken at our 40th reunion in June, if any classmates are interested. His address is Gladstone, N.J. . . . New address: Kuang-Piao Hu (K.P.Hu), VI, P.O. Box 380, Taipei, Taiwan. . . . Don't forget contributions to the Alumni Fund.—EUGENE R. SMOLEY, *Secretary*, 30 School Lane, Scarsdale, N.Y.

## '20

Things are shaping up well for the big 40th reunion at Chatham Bars Inn, the weekend starting June 10. By now you have been given the details so we won't repeat them here, but in case you read these notes but do not read your mail, all you have to do is drop us a line or pick up your phone and we'll give you the whole story. The names of those who have already signed up are a sufficient guarantee that this reunion will be as pleasant and enjoyable as those of the past, and that is saying a good deal.

It was heartwarming as always to get one of the inimitable Gallic cards from Denise and K.B. White, from their home in Paris. . . . Another one always faithful in this regard is duly acknowledged from our old friend Chuck Reed. . . . It was also nice to get a card from Bunt Murphy with the news that after 40 years of working with children, he is now director of a home for the aged at 1060 Amsterdam Avenue, New York City. Bunt has two sons, the older a forester in Syracuse, N.Y., and the younger a freshman at Marietta College in Ohio. I was also glad to get my annual card from Bud Cofren, who lives in New Hampshire in the summer and in Florida in the winter. Lucky fellow!

Good old Count Dumas is one of those who adds much to a reunion and he promises to be on hand for the 40th, "rain or

shine." Count, who was a professor, retired from teaching in Quebec a few years ago and manages a radio and TV service laboratory there which he says keeps him out of mischief. . . . Van Van Deusen retired from business after serving in the Air Force in World War II to become a rancher at Spring Hill Farm, Julian, Calif. He reports no less than seven grandchildren. . . . Albion Doe has moved from Bridgeport, Conn., to Eureka, Calif. . . . Gavin Taylor is now in Clearwater, Fla. . . . John Crowley is in Jupiter, Fla. He was formerly in Washington, D.C. All you Florida guys remember that it's nice and cool on Cape Cod in June.—HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## '21

Hurry, hurry, hurry! You may just have a chance to join the 1921 reunion in Mexico on March 10, 11, 12, and 13 at the 12th annual Fiesta of the M.I.T. Club of Mexico City if you act promptly—and you are lucky! Get in touch with Mexico reunion chairman Chick Dubé right away at the address given at the bottom of these notes by phoning him at his Boston office, Liberty 2-2185, to see whether you and your wife can get in under the wire.

If you answered the class questionnaire of last fall and said you were interested in attending our reunion in Mexico, you now have the latest mailing from Chick's committee and the complete program notice from the M.I.T. Club of Mexico, which is celebrating its own 50th anniversary from March 10 through 12 with the best of its dozen Fiestas to date. You also now know the special 1921 program planned for March 13 as the *pièce de résistance* of our second record-making reunion in a neighboring republic.

As we prepare these notes, Chick writes that there are 27 of the 1921 family who are scheduled to make the trip, including: George and Mrs. Chutter, Ralph and Mrs. Cooper, Chick and Maida Dubé, Herb DeStaebler, Dug and Betty Jackson, Mel and Anne Jenney, Phil Nelles, Larc Randall, Ray and Helen St. Laurent, Rufe and Madeline Shaw, Roy and Mrs. Snyder, Art and Mrs. Turner, Dave and India Woodbury and probably one additional couple. Joe and Mrs. Gillson will be in Mexico City, attending the convention of the American Institute of Mining, Metallurgical and Petroleum Engineers, of which he is president-elect, and he may have to forego some of the reunion activities.

On behalf of all of us, our sincere thanks go to Chairman Chick Dubé and his committee for so thoroughly carrying out a well planned albeit heavy schedule of arrangements for our pleasure. More thanks go to all of the officers and committees and members of the M.I.T. Club of Mexico in anticipation of the splendid treat which they have prepared. We regret that it will be necessary to await the May or June issue of *The Review* before the whole story of our participation can be recorded in these columns. Please be patient or, better still, call Chick to find out whether you can join the merry throng and enjoy our reunion at first hand.

We have often remarked on the pleasure which so many members of 1921 and other classes bring to Maxine and your secretary in the form of friendly Christmas greetings, which we treasure far beyond the period during which they adorn the area around the tree. Our warmest appreciation goes to Jack and Elizabeth Barriger, Ednah Blanchard, Ethel and Phyllis Burckett, Phil and Edna Coffin, Hugh Darden, Ed and Helen Farrand, Harry and Catharine Field, Munnie and Alex Hawes, Sumner and Betty Hayward, Dug and Betty Jackson, Jack and Marge Kendall, Chick and Laura Kurth, Milicent and Joe Maxfield '10, Bob and Helen Miller, Regina and Gus Munning '22, Phil Nelles, Jr., George and Muriel Owens, Helier and Graciela Rodriguez, Ray and Helen St. Laurent, Gretchen and Paul Smith '51, Helen and Lem Tremaine '23, Louise and Carlton Tucker '18, Dave and India Woodbury and The Review editors, Diana de Filippi, Ruth King, Norma Humphries and Volta Torrey.

Phil Coffin reports a new assignment with Alcoa. He is now general manager of a newly-created organization, known as the Structural Division. Their transmission towers, made of aluminum, are being widely used by power companies. . . . Harry Field says he has just returned to his Honolulu home from Tokyo, where he met with the committee named to plan the Rotary convention to be held there in May, 1961. He and Catharine are still hoping they can make the trip from Tokyo to Boston for our BIG 40th reunion in June, 1961. . . . Sumner and Betty Hayward are back from their Florida jaunt, having missed seeing Glenn Fargo through a switch in itinerary which did not include St. Petersburg. . . . Dug and Betty Jackson's attractive greetings feature the two granddaughters who arrived in 1959 to bring the total to 10. . . . Jack and Marge Kendall sent a picture of their four fine grandchildren with Grandpa and Grandma in the lovely garden at Hermosa Place. . . . The annual pictorial masterpiece of the photogenic Bob Miller family group has been augmented by the addition of the newest arrival, Joan Marie Weaver. . . . Ray and Helen St. Laurent sent an exceptional portrayal of their delightful Vinalhaven, Maine. . . . Ed Farrand remembered us handsomely and we are most appreciative of his flattering comments on our class notes.

On the national scene, the 1921 news of the month concerns the Miami Beach sessions of the N.C.A.A. football rules committee, which is headed by General Robert R. Neyland of the University of Tennessee. They're still in executive session as we write this, but by now you know what changes were made, if any. . . . Dana C. Huntington, President of the Dennison Manufacturing Company of Framingham, Mass., has been elected a director of the Associated Industries of Massachusetts, comprising representatives of 2000 Bay State industrial concerns. Dana is also president of Dennison Manufacturing Company of Canada, Ltd., and managing director of Dennison Manufacturing Company, Ltd., of London, England. . . . Mail has been returned from Manila, R.P., for Manuel T. Manosa. Do you know his present address?

Augustus B. Kinzel has been appointed chairman of the division of engineering

and industrial research of the National Academy of Sciences. Further, to our brief note in last month's column, Gus was named as the 1960 recipient of the Industrial Research Institute medal for "outstanding accomplishment in leadership in and management of industrial research which contributes broadly to the development of industry and the public welfare." The presentation will take place next May. . . . Garvin Bawden's new home address is St. George Street, Duxbury, Mass. . . . Mrs. Alice Bronfenbrenner resides at 6916 Millwood Blvd., St. Louis 30, Mo. . . . Lewis E. Edgerton says he now lives at 100 Victoria Place, Syracuse 10, N.Y. . . . Walter J. Hamburger has moved from Dedham to a new home at 26 Crest Drive, Dover, Mass. . . . Augustus B. Kinzel makes his home at 4 East 70th Street, New York 21, N.Y. . . . James S. Parsons has left Mountain Lakes, N.J., and now receives mail at 1 West 54th Street, New York 20, N.Y.

Henri P. Junod has been elected a vice-president of the United Appeal of Greater Cleveland for 1960. A partner in Pickands Mather and Company, Harry was campaign vice-chairman of the Cleveland United Appeal last fall, which raised almost 12 million dollars. He is a director of some 12 companies and active as a former president and executive committee member of the American Coal Sales Association, member of the American Iron and Steel Institute, the American Coke and Coal Chemicals Institute and the Bituminous Coal Institute.

A welcome phone call from our class president, Ray St. Laurent, after a recent Washington trip, produced the news that Aubrey S. McLeod is head of the economics division of the *U.S. News and World Report*. His son, an Amherst graduate, was in Washington with the two grandchildren for the holidays. . . . Larry Conant is with the Federal Aviation Agency. Three of his four children are married and the youngest, a senior at Exeter, is considering entering Technology.

It is our sad duty to report the passing of Manuel Mendis Green in Boston on November 20, 1959. On behalf of the entire Class, we extend sincerest sympathy to his family. Born in Cambridge, Mass., on October 29, 1900, he prepared for the Institute at Rindge Technical School, Cambridge. At Technology, he was a member of the Chemical Society, the Aero Society and Tau Delta Phi. He was graduated with us in Course V. From 1919 to 1924, he was an instructor in the Department of Chemistry at M.I.T. He was associated with Central Electric Supply Company of Worcester, Mass., until he formed his own company, the Atlantic Electrical Supply Company, in 1927. He had been president and treasurer since that time and resided in Worcester until 1952, when he moved to Auburn, Mass. He was a member of the American Society of Chemical Engineers, the Joel Prouty Lodge of Masons and Temple Sinai Worcester Lodge B'nai B'rith No. 600. He is survived by his mother, Mrs. Judah H. Green of Cambridge; his wife, the former Molly Harr of Cleveland, Ohio; three married sons, Richard M., Syracuse '50, of Worcester, Robert T., Harvard '50, of Watertown, and William C., Miami '51, of Miami, Fla.; a brother, M. George Green of Worcester; two sisters, Mrs. Ruth Chess-

man of Newton and Mrs. Rose Martin of New York City; and three grandchildren.

If you haven't done so already, please answer the fine letter from class agents Ed Farrand and Larc Randall and make your 40th reunion gift (which is also credited to the Amity Fund) just as big as you can. Also please return the recent class questionnaire and help all of us in administering 1921 affairs. Dates to remember: Reunion in Mexico City, March 10-13, 1960; Alumni Day on campus in Cambridge, June 13, 1960; our 40th reunion and the M.I.T. Centennial, June, 1961. Hope we see you at all of these gatherings. — CAROLE A. CLARKE, *Secretary*, Components Division, International Telephone and Telegraph Corporation, 100 Kingsland Road, Clifton, N.J.; EDWIN T. STEFFIAN, *Assistant Secretary*, Edwin T. Steffian, Architect, 11 Beacon Street, Boston 8, Mass.; EDOUARD N. DUBÉ, *Mexico Reunion Chairman*, 120 Tremont Street, Boston 8, Mass.

## '22

The 1959-1960 directory of the Alumni Association lists about 1200 names of men who are active in Alumni affairs. Our Fred C. Koch and Theodore T. Miller are Alumni term members of the Corporation; Edmund D. Ayres is a member-at-large of the Council; our class representative is Warren Ferguson. Among the Council representatives of M.I.T. clubs are Parke Appel, Robert Brown, Yard Chittick, Oscar Horovitz, Robert Tonon, and Karl Wildes. Whitworth Ferguson is on the Alumni Fund board. Abbott Johnson is on the visiting committee of the Department of Humanities. There are 25 of our Class listed as chairmen and educational counselors from John Liecny in Arizona to Horace McCurdy in Washington. George Dandrow and Ted Miller are past presidents of the Association. We are proud of our class participation.

Frank T. Westcott was elected president of the American Contract Bridge League at their annual meeting in Coronado, Calif., in December. He also was captain of the team last winter which won the N.E. knockout team-of-four contract bridge championship. . . . Your secretary is happy with two recent honors: president of the Buffalo club and chairman of the board of directors of the Buffalo branch of the Federal Reserve Bank of New York. He will try very hard to live up to the press notices.

Dale Spoor was highly complimented as Chicago chairman of the Alumni Officers' Conference last October. This type of regional meeting has proven to be most successful. . . . Charles H. Cushman of Natick will serve as clerk for building of new schools. During his career as engineering officer, he was responsible for our naval construction for the New England area. Since his retirement he has assisted with various building projects including the Boston Museum of Science, Natick's Veterans\* Hospital, and the recently completed Wilson Junior High.

Thanks to Godfrey Speir of West Caldwell, and others, some suggestions are coming in for hotels and locations for our 40th

reunion. Godfrey has suggested Chatham Bars Inn at Chatham and Snow Inn at Harwichport. Please give us your suggestions. How do you feel about Baker House? How about the Griswold? Incidentally, and not so incidentally at that, keep pushing our man-sized gift to the Alumni Fund. It's getting late. . . . Merton Ticknor has moved to Hackensack, N.J.; George P. Anderson is now in Urbana, Ill.; George Marvin is now in Ft. Myers, Fla. New address for Rudolph Blatter is U. S. Embassy, Washington 25, D.C., and for Ralph Geckler, 606 Huron Road, Cleveland 15, Ohio. . . . Our sympathy goes to the family of Albert H. Clark of Attleboro who passed away last November. — WHITWORTH FERGUSON, *Secretary*, 333 Ellicott Street, Buffalo, N.Y.; C. GEORGE DANDROW, *Assistant Secretary*, Johns-Manville Corporation, 22 East 40th Street, New York 16, N.Y.

## '23

Henry B. du Pont, Vice-president of the DuPont Company, started a Philadelphia audience at the Franklin Institute by designating the modern corporation as fifth on his list of the "greatest inventions." His first four choices were the steel plow, Evans' automatic flour mill, the steam locomotive, and the telegraph. He said in part: "When the history of our era is written, the birth and development of the modern corporation must be recorded as a vital factor in our technological progress. Indeed, the corporation may well prove to be the greatest invention of them all."

Our genial classmate, Dave Skinner, manages to keep out of mischief by taking on several extra-curricular activities in addition to his duties as vice-president and general manager of the Polaroid Company. It has come to light that he is vice-president of the Cambridge Chamber of Commerce, a position he has now held for several months. . . . S. F. Brown co-authored an article with F. H. Norton '19, entitled "Constitution of Copper-Red Glazes." This paper appeared in the November issue of the *Journal of the American Ceramic Society*. Mr. Brown is presently in the physics department of Lowell Technological Institute.

How many of our classmates know that two distinguished members of our Class are also members of the Order of Daedalians? In fact how many of you know what the Order represents? Howard Russell and Colonel Walter E. Richards, to our knowledge, are the only members of our Class to be eligible and to be members. The Order of Daedalians was constituted in 1934 to transmit to posterity the traditions of flying which were established by the World War I pilot officers of the United States Air Service. Regular membership in the organization is available to people who were rated heavier-than-air aircraft pilot officers in the United States Air Service and who were commissioned prior to November 12, 1918, the day following the date of the World War I armistice. Presently, the organization has consecrated its activities to promoting safety of flying. An annual award is made to the major air force command having the best flying safety record. The trophy is a large silver cup. Colonel

Richards is captain of flight 5 located in San Francisco, Calif. He is also vice-commander of the national organization and a trustee of the Order's foundation.

We are indeed sorry to report the following deaths and wish to express the sympathy of our Class to surviving members of their families: Vern V. Cocks died on May 17, 1959 in Chicago, Ill.; Gerald Putnam of 258 Gray Street, Arlington, Mass., Assistant Professor of Engineering Graphics in the Mechanical Engineering Department of M.I.T., died on January 8, 1960 at the age of 57. Professor Putnam was born in Clinton, Mass., and worked with water power engineering companies in Albany, N.Y., before joining the Institute Faculty in 1933. He is survived by his wife, Dorothy Valentine Putnam.

The following address changes have been reported: Stanley B. Black, 4 Nassau Drive, Winchester, Mass.; Beverly M. Brown, Apt. 402, 1321 Spruce Street, Philadelphia 7, Pa.; Colonel John Huling, Jr., R.R. #1, Lauderdale Lake, Elkhorn, Wis.; W. Barton Jones 580 Monterey Pass Road, Monterey Park, Calif.; Commander Julian S. Loewus P.O. Box 18522, Atlanta 5, Ga. — HERBERT L. HAYDEN, *Secretary*, E. I. du Pont de Nemours and Company, Leominster, Mass.; ALBERT S. REDWAY, *Assistant Secretary*, 47 Deepwood Drive, Hamden 17, Conn.

## '24

You probably noted with interest the smiling likeness of our New York V.P. in the January Review. It's probable no one was confused by the caption which mixed him up with the other gentleman. After all, there's only one Paul J. Cardinal. The American Management Association met in grand conclave late in January in New York to discuss "Managing Technology." Among the distinguished technological managers who addressed them was Cyril J. Staud, Eastman's V.P. in charge of research.

My thanks to all of you who so kindly sent Christmas cards. Do wish there had been more grist for these columns included, however. The Clarke Williamsses supplied the information that their son was married in September and "is now in Boston going to that wonderful institution, M.I.T." Last year their card was a beautiful puzzling photographic design. This year it's plain what the photograph is, a town. Since it was not identified, I assume it's Bellport, Long Island. . . . Mike Amezcaga says that he and Hortensia are still reminiscing about the good time they had at reunion and are already looking forward to the 40th. As for conditions in Cuba, "things are not going the way I would like them, but I guess we must have patience." From Mexico comes the annual Nevin News Flash featuring a photo of Jack looking very grandfatherly with a dog in his lap, a grandson in his arms and his feet on an ottoman. Son David was married last summer and is now assistant manager of T. M. Nevin Company. As soon as son John gets out of the Army and through the University of New Mexico, he too will join the company. Then Jack and Gerry will presumably have nothing else to do but play with grandchildren.

The Phil Bates family still have one representative at M.I.T., Phil, Jr. Son Brad graduated last year. There are evidently a few spots left in California that Phil and Jacky haven't seen, and they use visits from friends as an excuse to go there. So if you want a personally conducted tour of some California beauty spot or other, plan ahead. Two of our Californians couldn't take Christmas there. As reported last month, the MacCallums were here for the holidays, and we discovered that the Greatwoods were, too. Royce dropped in just after Christmas. Seems there is a lot of family in the New England area, so Royce rented a big house in Marblehead and got them all together there. His business with the Japanese is booming. He spent five months in Japan last year and will be going back again in March or April. He imports their transistors and exports nuclear reactors and airplanes, among other things.

Since Sam Helfman never did provide the dope Hank Simonds promised he would, Hank has done it himself. A very impressive brochure of Barnard and Burk, consulting engineers in Louisiana, shows a striking portrait of Sam who is billed as an associate and chief engineer, utilities department. Some idea of the size of the business is given by the fact that they have currently 245 assignments with a valuation of \$350 million.

Maybe you remember the name of Luang Videt-Yontrakich. You certainly don't as a student, because then his name was a little different, Soonchong Boon Punyagupta. He's a civil engineer and for years has been superintendent of the Royal State Railways of Thai. Now he writes that his address for the next four years, at least, will be the Royal Thai Embassy in Washington. Didn't say whether or not he'd become a diplomat or whether he was buying up old B and M rolling stock. There's plenty of it, but we wouldn't wish it on the Thais.

It is again my sorry duty to report that more classmates have died. William C. Powell was a navy man who got his master's degree with us. He left the Navy back in the '30's, was with the Bureau of Ships during the war, but except that he was living in Washington when he died last summer, we have had no further information. Joseph H. Townsend, a Course VI graduate, had been with the Bell Telephone Company of Canada all these years. He died in September. Another electrical engineer, Robert A. Ford, was with the U.S. Waterways Experiment Station in Vicksburg until his death in December. There are no further details to report. — HENRY B. KANE, *Secretary*, Room 1-272, M.I.T.

## '25

The past month has brought considerable information regarding 1925'ers in the form of letters—a reporting procedure which is most desirable and greatly appreciated by your secretary.

Chink Drew, well known to you as our Alumni Fund class agent, sent me a newsy letter, and of the greatest importance, noted that he is now president of A. Schrader's Son, Inc., in his own words the world's largest and oldest company in the

pneumatic valves business. Chink tells of a number of our classmates whom he has seen recently, including the following: Sam Spiker, special gifts chairman for the Class, who is doing a fine job on the Alumni Fund, is vice-president of the Kinney Shoe Company, one of the competitors of Maxey Jarman. Maxey, President of National Shoe Company, pulled his end of the rope on our Freshman tug-of-war team and finally left the Institute to go into business with his father. . . . Another hard worker on the Alumni Fund is Mal Davis who is sending out personal letters to many of the classmates in the New York area. Mal is vice-president of Gilbert Associates, Engineers and Consultants, and travels all over the world on various projects in South America, Asia, and so forth. . . . Chink has been in correspondence with Bob Huthsteiner, President of Cummins Diesel, a company which has been making great progress in establishing foreign operations and developing new and revolutionary products for various vehicles. Bob has reported his 1959 sales as being up 32 per cent and the company profits doubled.

Chink himself has been doing a great deal of traveling in the past two years, having visited South America and Europe; and during January 1960 he made a business trip to France. In the London airport last fall he ran into Bill Asbury, now vice-president of the Standard Oil (New Jersey) Development Company. In covering the United States he has run into Jack Fielding, Vice-president of the Armstrong Tire and Rubber Company in West Haven, Conn.; Tony Lauria who is head buyer in the Sears Roebuck automotive department; and Payson Hammond and Wade Johnson in tire design and tire testing, respectively, with the Goodyear Tire and Rubber Company.

I am sure you will be interested to know that Ted Mitcham is now in Vermont and may be addressed at Woodedge Farm and Kennels, Middlebury, Vt. He states that he has "gone to the dogs—larger ones and more of them—Chesapeake Bay retrievers." He raises them, hunts them for partridge, pheasant, grouse, woodcock, and water fowl, and sells them to people who appreciate real hunting enough to want the best.

A Christmas card and a nice letter came from Masaru Kametani, who is with the Tanashi Aircraft Engine Works in Tokyo. The Japanese government has selected the Lockheed F104C-J as their next fighter plane and plans are underway for getting production started early in the spring. Mr. Kametani hopes to be among the members of his company who will be visiting the United States for business negotiations and training.

A clipping from the Worcester, Mass., *Telegram* notes that Ted Butler has recently been appointed a Vice-president of the Worcester County Electric Company. Ted joined this company as an executive assistant in 1952, having been, prior to that time, vice-president and manager of the Northampton Electric Lighting Company and Northampton Gas Light Company. He is active in civic affairs in being a member of the Grafton school committee as well as a member of the Worcester Kiwanis Club.

A group of more than 40 Bell Telephone Laboratories' scientists and engineers

visited M.I.T. and its Lincoln Laboratory for two days in December. It was interesting to note that two members of the Class of 1925 were included in this group; namely, Robert L. Dietzold and King E. Gould. Sam Caldwell was one of the interesting speakers at this meeting, describing in some detail the work he has been doing in the development of a Chinese typesetting machine.

Among address changes received is one that notes that Walter Siddall, whose old address was Clifton, N.J., is now with the Radio Corporation of Cuba, Carlos Tercero 508, Havana, Cuba.

I am sorry to have to report that Arthur H. Page died on September 20, 1959 in Los Angeles, Calif. — F. L. FOSTER, *Secretary*, Room 5-105, M.I.T.

## '26

At Christmastime we hear from so many classmates that instead of an empty barrel we have a full folder and can give you a once-in-a-while report from your classmates. I will enter one short note, however, about Pigeon Cove — about the storm of the century. A couple of weeks ago the tides were the highest in 108 years and a nor'east storm hit at the same time. We were uptown and missed the show but the local folks are still talking about it. It was really wild. Fortunately, our coast is rugged and damage in the area was at a minimum contrasted with south of Boston. I have talked with some of my artist friends who were out observing the storm and expect to put their observations on canvas. Many of them simply record a mental picture and paint it later. Certainly the school that sets up an easel under a shady tree would not have been operating in this wild weather. If anything interesting comes of it I'll report to you later. Now let's have the report from the Class.

We always receive an interesting Christmas card from George Makaroff with some sage advice: "Since you are a sailor I'll say 'keep sailing' but never beyond the horizon for we do need you at the typewriter, where you perform cum laude (ditto sails, I hope)." . . . Another Christmas card from Martin Staley enclosed a note on his own mechanical engineering firm's paper in San Antonio: "It is always with pleasure that I turn to the '26 class notes in The Technology Review and read your interesting items, especially about your place at Pigeon Cove, which must be a wonderfully relaxing spot giving you inspiration to write the notes. Since the 30th reunion, there have been two major items of interest in my life. I retired from the Army reserve (with pay) after over 35 years total service, but that does not mean I have retired from my consulting work which keeps me busy six days a week and usually a few nights a week for "palone." Also this year my two daughters brought into the world my 11th and 12th grandchildren. They both live in San Antonio with their families, so there is quite a brood when they all get together. P.S. Model railroading is one of my hobbies."

Another card from John Sumner brings us up to date on his whereabouts: "I have been transferred to our Chicopee Falls,

Mass., plant where I now function as director of quality control for our five woven goods plants. Quite a switch. But I like it. My daughter Betsy is married and lives in Miami, Fla. Jack is going to Rutgers." . . . The next card was forwarded to me from Stewart Perry because it brings us up to date on John Oakley. The message on the card was written by John's wife and tells that they are off to France with all their household effects. John has been there all summer and is to be the technical superintendent at the new Goodyear plant in Amiens. They expect to be in Paris for several months and then go north. We hope that Fred Walch will pick this out of the notes and contact John.

Not a Christmas card but, believe it or not, a real letter from Jim Drain! We will quote directly from it: "After 18 years with the Joy Manufacturing Company, I left them August 1, 1959, to become a vice-president of the H. I. Porter Company here in Pittsburgh. This required no moving of the home or family and my office is only a block away from where the old one used to be. H. K. Porter is a very rapidly growing company (sales for 1959 approximately \$220,000,000), and is also highly diversified. My duties have to do with our Canadian division and three of the electric product divisions in the States. This is all very interesting as you can imagine. My address is Porter Building as shown above, and I would be delighted to see you if you ever get out this way." Do these messages from classmates inspire you to write to your class secretary? The address is below and we look forward to hearing from you. See you in April. — GEORGE WARREN SMITH, *Secretary*, c/o E. I. duPont de Nemours and Company, 140 Federal Street, Boston, Mass.

## '27

Robert M. Bigelow of Wellesley Hills was recently elected a vice-president and director of the United Shoe Machinery Corporation. Bob joined United's research division in 1929 and was appointed director of research in 1955. He is also president and director of the K. J. Braun Engineering Company of South Norwalk, Conn., and a director of the A. Kimball Company of New York and the National Tag Company of Dayton, Ohio. . . . Elevation of Charles Kingsley, Jr., Associate Professor of Electrical Engineering at M.I.T., to the grade of Fellow, was announced last fall by the American Institute of Electrical Engineers. Professor Kingsley was cited for "contributions to the teaching of electrical engineering and to the theory of electrical machinery."

Tom A. Knowles, President of Goodyear Aircraft Corporation, has been named to the Board of Governors of the Aerospace Industries Association (AIA), formerly Aircraft Industries Association. As a member of the Board, he is serving with 25 other chief executives of the nation's leading airframe, engine, missile, and spacecraft manufacturers in guiding the activities of the AIA. Associated with the Goodyear Tire and Rubber Company since 1927, Tom has headed the firm's aircraft subsidiary since 1947. He was named president in

1956. A native of New Bedford, Mass., Tom resides at 247 Hollywood Avenue, Akron 13, Ohio.

Tom E. Stanton was named water commissioner of the city of Cleveland, Ohio, last August. He is a 22-year veteran of the department and lives at 2650 University Boulevard, Shaker Heights, Ohio. For eight years Tom was a hydraulic engineer in New York. . . . Frank C. Staples at 54 has been re-elected president of the American Molasses Company in New York City. It is the largest company in the molasses business and does a greater than \$50 million a year business. Frank's success story has been in the Horatio Alger tradition. It is the story of a former *Enterprise* newsboy, who later was a filling station attendant while working his way through M.I.T., who rose to become the president of a multi-million dollar business. Frank is married and the father of two married daughters. He and his wife live in Floral Park, L.I., N.Y.

Kimball L. Wheeler has been made a Fellow by the American Institute of Electrical Engineers "... for contributions to the development of a large power system and the rehabilitation of power systems in Korea." After receiving his B.S. and M.S. degrees in Electrical Engineering from M.I.T., Kimball was employed at Stone and Webster, Inc., as a student engineer, and was assigned to the Blackstone Valley Gas and Electric Company. In 1933, he joined the Cleveland Electric Illuminating Company as a substation operator. He was promoted in 1937 to junior and then senior engineer in the substation division of the electrical engineering department. In 1943, Kimball joined the U. S. Army Signal Corps as a first lieutenant and was later assigned to the Signal Corps Standards Agency as officer-in-charge of the electromechanical section. In 1944, he was assigned as engineering officer of a Philippine civil affairs unit stationed in Manila. After V-J Day, he was assigned as engineering officer to a military government company and transferred to Korea where he became enemy property custodian of Cholla Pucto province. In 1946, with the rank of major, Kimball was made chief, electric section, Department of Commerce, responsible for the operation and engineering of all utilities and electrical manufacturing in the American zone of Korea. Returning to the Cleveland Electric Illuminating Company in 1946, he became a senior engineer, and, in 1951, a supervising engineer of the substation engineering section. In 1953, he was promoted to manager of the plant and substation engineering department, which is his present position. Kimball has served on the American Institute for Electrical Engineers switchgear committee, substations committee, power division committee, and section committee. — J. S. HARRIS, *Secretary*, Shell Oil Company, 50 West 50th Street, New York 20, N.Y.

'28

We have before us two items concerning two of our esteemed classmates. These items are further reminders that '28ers are still vigorous in professional pursuits and occupy important roles in this age of exploding technology.

The Sunday edition of the Lowell, Mass., *Independent* carried an informative account of John Stack's past and current activities in the development of the country's aeronautical and space program. Now assistant director of Langley Research Center, Langley Field, Va., John has been with the center since his graduation from the Institute in 1928. During his busy and exciting career, John has designed and used high-speed wind tunnels to test and study both ballistic missiles and airplanes of every kind. Langley Field is now the nucleus of the National Aeronautics and Space Administration and John has contributed importantly to its basic research work. He is the author of scores of research papers, has been honored by countless professional societies, and is one of only three men to win twice the Collier Trophy, America's most distinguished aviation award. The Stacks have a ranch-style home overlooking a tributary of the York River. Daughter Martha is married and living in Richmond, Va. Son John served in the Marine Corps and is now also a member of the staff at Langley Center.

In the November, 1959, issue of the *Carnegie Alumnus* we are informed that "Dr. Dennistoun W. Ver Planck, currently head of the department of mechanical engineering, has been appointed assistant director of the John Jay Hopkins Laboratory of General Dynamics' General Atomic Division. Dr. Edward C. Creutz, director of the laboratory and vice-president of General Atomic (and a former head of the physics department), announced that Dr. Ver Planck will join General Atomic Division full time on February 1. Dr. Ver Planck has been professor of electrical and mechanical engineering at Carnegie Institute of Technology since 1946. For the past two summers Dr. Ver Planck has also been a senior consultant at General Atomic where his work has included the fields of thermal stress and heat transfer problems related to nuclear reactor design and vibration and stress problems in other areas of work.

"Dr. Ver Planck's first industrial association was as an engineer with General Electric Company. In 1936 he became assistant professor of electrical engineering at Yale University. During the war he served with the U.S. Naval Ordnance Laboratory, and was awarded the Navy Commendation Ribbon and the Order of the British Empire for the leading role he played in the Navy's program to develop means to protect the fleet from magnetic mines. In the field of electrical engineering, Dr. Ver Planck has done advanced work in such fields as transients in relay contact circuits, high voltage breakdown of air, magnetic Barkhausen effect, and magnetic amplifiers.

"While at Carnegie, Dr. Ver Planck has been instrumental in adapting the course of study in mechanical engineering to the methods of the Carnegie Plan, emphasizing the scientific principles underlying mechanical engineering. Through this period, Dr. Ver Planck has gained a national reputation for his ability in engineering analysis and his exceptional command of mathematical tools necessary for engineering analysis."

To these distinguished classmates, our admiration and congratulations for such outstanding records of achievements! —

GEORGE I. CHATFIELD, *Secretary*, 11 Winfield Avenue, Harrison, N. Y.; WALTER J. SMITH, *Assistant Secretary*, 15 Acorn Park, Cambridge, Mass.

'31

A welcome note from Emmons (H. E.) Raymond tells that he and his wife Virginia have moved from Albany to White Plains, N.Y. His new address is 101 Old Mamaroneck Road, and telephone is White Plains 9-4294. Emmons is secretary of three trade associations of paper converters (Linen and Lace Paper Institute, Printed Paper Mat Institute, and Food Tray Association). It was considered advisable to move the office from Albany to New York in the interest of efficiency and better service to the members. He has become an ardent supporter of the M.I.T. Club of New York and frequently enjoys renewing old acquaintances there.

On January 1, Morley Taylor was appointed president of the International Power Company, Ltd., with headquarters in Montreal. Actually, he returned to the company that he has been with most of his life, until he went to Halifax about five years ago to be general manager of the Nova Scotia Power Commission. Morley writes that he enjoyed the work in Nova Scotia and all of his associations there. He is now established in Westmount, a suburb of Montreal. Morley, who was born in Parrsboro, Nova Scotia, was president and general manager of International Power Company's operating subsidiaries in Venezuela from 1938 to 1955.

A clipping from the *Boston Herald* reports that George Bunker told the Boston security analysts that Martin, "first of the old line of aircraft builders to shed its wings" after 1945, is in the thick of the space age. He complained that the public still regards the company as the builder of the famed bomber and Navy seaplanes.

It is with sorrow that I report the deaths of two classmates, Philip D. Hardy and Frank Terdina, Jr. Philip Hardy passed away on September 5, 1959, and Frank Terdina, Jr., on August 26, 1958. No details have been received.

Among the class of '31 on the move are Edward F. Abbott, whose new address is 5111 Erie Street, Racine, Wis.; John H. Arnold, 10 Pembroke Road, Summit, N.J.; Colonel Benjamin S. Mesick, Apt. 36, 2820 East 6th Street, Tucson, Ariz.; Harold E. Searles, 59 Liberty Avenue, Lexington 73, Mass.; William H. Weeks, 3230 Woodley Road, N.W., Washington 8, D.C.; and Kenneth E. Wischmeyer, 11345 Mosley Lane, St. Louis 41, Mo. — EDWIN S. WORDEN, *Secretary*, 9 Murvon Ct., Westport, Conn.; GORDON A. SPEEDIE, *Assistant Secretary*, 90 Falmouth Road, Arlington 74, Mass.

'32

Some of my chiding has drawn blood. I have some news to report from men who have been kind enough to write me letters. But I need many more. Bill Hall, X, writes: "I came with Atlantic direct from M.I.T., so I am now in my 27th year with the com-

pany. I was fortunate in having a good wife pick me out, and we have four hale and hearty children, ages 9 to 24. The oldest boy was recently married to a Virginia girl. As you know, boating is my undoing. I have a 28-foot ketch with seven bunks, but keeping them filled is somewhat of a problem. I cruise to New England every summer and I am a member of the Beverly Yacht Club in Marion, Mass. My wife is fed up with the Jersey coast, therefore, she drives to New England and I meet her up there.

"I am always trying to line up a crew to make the trip between Marion, Mass., and the Chesapeake Bay where I keep the boat in spring and fall. If you know of any good sailors, whose wives are willing to let them away from home, who would like to make the trip, tell them to get in touch with me. You should warn them, however, that they should like long hours and rough water."

Nathaniel Saltonstall, IV, was in the news recently for his many contributions to art life in Boston: "Since 1935, when Nathaniel Saltonstall started the infant Institute of Contemporary Art, to the present, when his firm of Saltonstall and Morton designed the Institute building as a permanent domain on the grounds of the Metropolitan Boston Arts Center, Mr. Saltonstall has given his entire adult life to the development of the cultural arts in Boston. Serving as president of the Institute for 10 years, he is now on the board of the corporation; a member of the selection committee of the Acquisition Society and the exhibition committee of the Institute. Mr. Saltonstall serves as a trustee of the Boston Arts Festival, vice-president of the National Council for United States Art in New York; and is a member of the board of the Friends of Chamber Music.

"He is a trustee of the Boston Museum of Fine Arts, a member of the committee of the School of the Museum of Fine Arts and the committee to visit the Fine Arts Department and the Fogg Art Museum at Harvard University. His most recent interest is the activities of the newly incorporated organization, the Association of the Arts of Music, of which he is its first president. He is a member of the American Institute of Architects, of the National Council Architectural Registration Board and the American Arbitration Board.

"Mr. Saltonstall's hobbies? Art, of course, in which field he has collected, over the years, contemporary works of art, water colors, oils, drawings, and sculpture. He likes to help struggling young artists in the art and music world. In this regard he maintained a summer gallery at Wellfleet, the purpose of which was to exhibit works of unknown artists of today."

Mike Castleman, X, sent me the following: "I am still actively engaged with Lloyd Laboratories — our principal product is pigment leather finish. A pair of shoes may contain about 4¢ of our material. Although a late starter in the field of matrimony, I can report three children; Lloyd, Robin, and Lisa — and a fourth on the way. Being president of the Temple Shalom in Salem helps to keep me busy. I am still playing respectable tennis, ski a bit, but I am having serious trouble breaking 100 in golf."

Arthur G. Russell, XV, had a big spread in the Bristol, Conn., *Bristol Press* not

so long ago. He is president of the Arthur G. Russell Company and just moved into 18,000 square feet of floor space in a remodeled building in Bristol, from their previous headquarters in Forestville, Conn. His is a designing and building firm for almost any special kind of purpose machinery "which makes production easier and more efficient, which permits pieces to be turned out by the thousands in the same length of time that hundreds of these same items were formerly turned out as finished products." Good luck in your new quarters! — ROLF ELIASSEN, *Secretary*, Room 1-138, M.I.T.

## '33

Several Christmas cards from '33ers around the world brought welcome news — with a P.S. that the class notes are read and appreciated. (This is not a plug to get on your Christmas card list.)

By way of George Henning, we are happy to brief you on Art Hungerford and his family: "Helen (Mrs. A. H.), in June, ended her stint teaching drama and speech at the Pleasantville High School and is now devoting her time to writing, and occasional painting and dancing. Daughter Gale nearing 15, is on the field hockey team, and is vice-president of her homeroom. I got an M.A. at New York University and on September 1 joined New York University on the staff of Dean Thomas Clark Pollock. We are engaged in planning a new liberal arts college which would de-emphasize classroom procedures in favor of independent study techniques, including a tutorial system and televised lectures as central learning opportunities."

Every once in a while, our good friend Warren Henderson takes his typewriter in lap and lets us scan one corner of his fast-working mind; it's always interesting, humorous, and salty. Thus, says Warren: "Last fall, we held an auction sale and sold most of our good Angus breeding cattle. We kept only 12, all daughters of our bulls, and we do not wish to get much bigger again. The large herd was cramping my style, and was not allowing time enough for other activities. We will spend all our summers in Exeter, N.H. (May 30 to Nov. 10). Drop in and take home a calf, or just drop in. There is always something refreshing on hand, no matter what you use for a refresher. This goes for all fellow refugees from 1933.

"We have recently purchased a piece of property in Hypoluxo, Fla., on the west shore of Lake Worth. Where is Hypoluxo? Between Lantana and Boynton Beach. Where are those two? Between West Palm Beach, and Delray Beach. Oh nuts, get a map. We have a hundred yards on the big, salt-water lake, and intend to go into the boat storage business. Our son-in-law, Frank Carey, will operate a small boat and outboard business, on part of the property, and we will take the easy way; store your small boat under cover, dry. We will call ourselves "Boat Square." The Carey business is already operating, and is "Tropical Marine, Inc." Outside of boat storage, we offer a one-stop service to small boaters; gas, oil, bait, fresh water, beer, and soft drinks. Eventually, Boat Square will build

and operate quite a large Marina with docks for boats to approximately 35 feet. Anyone who has a boat that draws less than six feet can come in our channel, marked by range signs and green lights, at night. Needless to say, our good son-in-law will operate both businesses; I just like to supervise. Please note the Florida home address. Someone might want a refresher, here: 1079 Hillsboro Beach, Pompano Beach, Fla. All '33 is welcome, as always." There you have it, straight from the horse's mouth. We're somewhat troubled that Warren has gone from bulls to boats; we hope he has at least one dog.

The award of the month — and congratulations from all of us: Morris Cohen, Professor of Physical Metallurgy here at Tech, received the Francis J. Clamer Medal from the Franklin Institute for his assiduous investigation and lucid exposition on the heat treatment of steels. Morris has 94 papers to his credit — a productive guy, too, quite apart from his writing.

Several moves in the basket: Carl Burbank, from an A.P.O. New York to Manhattan Beach, Calif. We note that the Lieutenant Colonel is now "removed" from the stencil, so Carl is presumably back in "civvies" again. . . . And G. Russell Eddy from Wernersville, Pa., to Syracuse, N.Y.; we suspect that this makes it official, since Russ has been in Syracuse all the time. Russ is the other (greetings, Westy) class bachelor; two handsome guys they are, too. . . . Gene Nedbor from Rockville Center, N.Y., to Chestnut Hill, Mass. Welcome home, Gene. . . . Finally, Ed Rowell writes that he is back in the U.S.A. from Saudi Arabia by way of Athens, Rome, Florence, Venice, Lucerne, Naples, Cannes (they spent New Year's here!), Barcelona, Gibraltar, and Casablanca. Now, boys and girls, where have you been and what have you been doing? Do write. — R. M. KIMBALL, *Secretary*, Room 3-234, M.I.T.

## '34

This secretary takes a fair amount of kidding around Cambridge for being a member of the class with four secretaries. Let me tell one and all that it is a wonderful arrangement and you will see other classes copying us. 1934 in the lead again! Hank Backenstoss and his wife Nicole must be busy, as usual, in Beirut, Lebanon. A long New Years letter, written by Nicole, came just in time to meet the deadline for this issue. She writes in part: "I know you are anxious to hear about our first steps in our new country, Lebanon. Well, surprisingly enough, we have grown accustomed to its way of life quite quickly; partly because there are so many American products on all sides, and partly because Hank has seen so much of the continental way of thought and behavior that the oriental things we see are not so strange now.

"One day while we were looking for an apartment Hank disappeared. When I finally found him, he was taking Turkish coffee and speaking French with the concierge of a building he had just visited. A few days later, you should have seen my eyes popping when three camels met us on the road! Even Martine got involved in promoting Arabic fashions by sneaking a

tarboush (red conical hat) and parading with it on her head. Hank is in charge of the heat-power courses in the school of engineering and, so as not to be himself a stranger to the students, is trying to pass his consulting knowledge on to five seniors — quite a large group! He has other activities and in his spare time also oversees (often speaking in French!) the boiler plant and the generating station which supplies steam and electricity to a part of the university. Both systems are just going into service and have some special problems.

"We live in a very lovely apartment with a view of the blue Mediterranean and of the Lebanon Mountains to the east. We hope to see the famous cedars of Lebanon quite soon and already have explored the rugged mountains. There are many other places of historic interest within striking distance, but we have made no plans to see them except to think about a visit to Jerusalem at Easter. No one will expect us to have weighty opinions about this area so soon, but there are two things which impress us so far. They are expressed by two arabic words — 'bukra' and 'm'alesh.' The first means 'tomorrow' — the day when many things are done here. The second means, rather broadly, 'never mind' or 'it doesn't matter.' Perhaps what you want is not available so something else is substituted — it doesn't make any difference after all, does it? Well, perhaps not, but on the other hand perhaps it does. Lebanon, despite many modern aspects, has a great need for education in a vast number of fields, many of them technological.

"We find the people we have met delightful, alert, friendly, warmly hospitable, and interesting. This reaction is, we fear, not found by all Americans, but we have been especially fortunate. Besides we are only 50 per cent American! So we are enjoying our life here. Our only serious complaint is that you are not all here to keep us company and enjoy it, too!"

David Ingalls, in writing to Jim Eder, says in part: "Since June there have been some changes in my life. I think I told you when we last met, I sold Airtron, the company which I organized in 1946 and directed the growth of over a period of 13 years. It was doing over \$10 million a year of business and employed over 800 people. In selling out we agreed to remain on for a year, and as the year is now over, I have decided to take a sabbatical leave from the microwave industry. My wife and I are departing on January 7, 1960, for a trip around the world. I can report, if I knew how wonderful it would be to have some time off, I would have done it years ago, but at the same time I can assure you that I am looking forward, when I return, to getting active again." News from here and there and especially from classmates around the world will be most welcome for future class notes. . . . Jacob J. Jaeger has been elected president of Pratt and Whitney Company. At the time our 25th reunion classbook was made up he was a director, vice-president and chief engineer.

It is with regret that I write of the death of Vincent J. Rother on November 8, 1959. He was a resident of Montreal, Quebec, and I have no further details at the present time.

Karl A. Gardner, after 23 years with Griscorn-Russell Company, of Massillon,

Ohio, and recently their chief engineer, has resigned to accept the position of vice-president, engineering, of Yuba Consolidated Industries in San Francisco, Calif. His offices are in Yuba's engineering and marketing division on the Stanford University industrial grounds. He and his family moved to Palo Alto in November, 1959. His new address is 1145 Hamilton Avenue, Palo Alto, Calif. . . . Frederick C. Johnson has been named vice-president and general manager of the scale division, one of four newly created operating divisions of Fairbanks Morss and Company. He will have complete responsibility for the production and marketing of the company's entire line of mechanical and electronics scales made in factories in St. Johnsbury, Vt., and East Moline, Ill. — MALCOLM S. STEVENS, Secretary, Room 20B-131, M.I.T.; other Secretaries, JAMES P. EDER, 1 Lockwood Road, Riverside, Conn.; G. KINGMAN CROSBY, Longwood Road, Huntington, W. Va.; HAROLD E. THAYER, 415 West Jackson, Webster Groves 19, Mo.

## '36

We didn't make the last issue due to a combination of traveling, the holidays and a move. A contractor had been working on our house for the past eight months and that seemed too long. We sort of thought of it as a simple structure. The contractor had different ideas and felt that a year might be considered a reasonable period considering the great number of changes and delays resulting from Ann's specially designed equipment. However, the decision was made — to be in by Christmas — and we were sharing it of course with a dozen or more subcontractors. Yours truly is in California, a comfortable distance from the theatre of operation, but bound by an agreement to check with GHQ twice a week via Mr. Bell's gadget. Things are shaping up now and Ann's top priority item is the conversion of an antique smoking stand into a mailbox acceptable to the postal authorities. The important part of this nonsense is that you send all of your future material for the notes to our new address: Indian Harbor, Greenwich, Conn. Please try to overwork that old mail box! !

Now to get down to some more important address changes. In Connecticut: Pyam Williams, Box 257, Montville; Franklin Cooper, 5 Parsell Lane, Westport; and Ed Hinchey, North Woodstock. In California: Dave Gildea, 9679 La Alba Drive, Whittier; Boris Maximoff, P.O. Box 232, Palo Alto; and Stan Freeman, 703 Hillcrest Road, Beverly Hills. In New York: Len Wuosmaa, Sheridan Village, Apt. 16A2, Schenectady 8; and Fletch Thornton, 233 Broadway, New York City. (This address was sent to me by the Alumni Office and I wonder about it. Fletch is mayor of Summit, N.J., and I doubt if a politician like him would try to move in on Manhattan.) It is probably a new business address — I would check on it if it didn't mean a coast to coast call. If you really want the facts, write him.

In Pennsylvania there are two new '36 residents and another moving from Pittsburgh to Media. The latter is Dan Carroll, Fox Road, RD #16. Fred Story can now be

reached at RFD #2, Cochranville. Al Bagnulo, the colonel who is always on the move (best address up to now has been Idlewild Airport) will stay put for awhile. Al is once more a "brown bagger," this time at the U.S.A. War College, Carlisle Barracks — Student Detachment. Two moves within New Jersey and one newcomer: Phil Vincent from New Hope to Lake Trail West, Mt. Kemble Lake, Morristown; and Leo McKenney from Allendale to 40 Danebury Downs, Upper Saddle River (sounds like a good setting for a TV western). Ed Nicholson moved into the Garden State from The Hague, Netherlands. His new address is Esso Research Engineering Company, Refining Liaison, P.O. Box 215, Linden.

In Massachusetts: Bush Merrill has dropped the "Captain" and now lives at 87 Gerry Road, Brookline 46; Don McMullin, 698 Massachusetts Avenue, Cambridge 39; Tony Belser, 61 Radcliffe Road, Wellesley 81; and Dick Morton, 25 Knowelton Avenue, Shrewsbury. In other places: Martha Williams, 512 Foulkstone Road, Sharpley, Wilmington 3, Del.; Joe Gratz, 7701 Pierce Street, Omaha 14, Neb.; Len Stoloff, P.O. Box 8 Rockport, Maine; Hank Furniss, Union Central Life Insurance Company, Suite #1, Peachtree-Baker Building, Atlanta 3, Ga.; Jean Leman, Candiac Den Corporation, Suite #810, 2100 Drummond Street, Montreal, P.Q., Canada. Three classmates have requested to be removed completely from the lists: John Williamson, 120 West Republic Avenue, South Weymouth, Mass.; Al Barron, no address; and Alvin Morcross, 341 Lexington Street, Auburndale 66, Mass.

Received a nice letter from Eli Grossman, our class treasurer. He reports: "In the spring of 1957 I moved to the West Coast after resigning my position as vice-president and actuary of the Union Labor Life in New York. I started as assistant vice-president and associate actuary for the Beneficial Standard Life in Los Angeles. While there I saw such notables as Richard DeWolfe and Hank Lippitt. They both seemed very prosperous and cheerful. Dick was very active in the Tech Club of Los Angeles. Hank (still a bachelor) appeared to be especially energetic and keenly interested in travel, his work, and his usual other items.

"Instead of staying in California, I decided to come back East in the spring of 1958. It is true that California is very enjoyable and the opportunities there are quite good. However, the main reason for coming back was the chance of starting a new life insurance company that is basically an M.I.T. corporation. It was incorporated by Harry Kalker'23 and William Kalker'26, as well as myself, in Rhode Island. Since Hank Lippitt was originally from Rhode Island, he was able to be helpful to me. The company has been officially launched, and we are actually selling policies. It is called the Great Eastern Life Insurance Company. The Kalkers are not residing in Rhode Island, leaving me in charge of the insurance operations.

"While in Rhode Island, I have run into a few of our classmates. Frank Bliss, who left us after two years in order to go to Harvard Dental School, achieved an outstanding record at the Harvard Dental School. In addition to a practice here, he also lectures at Harvard.

"Concerning my Course XVIII associates, recently we spent a pleasant afternoon with Al LeShane and his wife and children. He is currently treasurer of the Employers Insurance Group in Boston. Ken Arnold'37 and his wife dropped over one day when they came to Providence to visit his parents. He is a professor of mathematics at Michigan State. It's over a year now since I've seen Brockway McMillan. At that time, he was doing extremely well at Bell Labs. He had been on the faculty in the mathematics department at Princeton, and now I hear he is working with Dr. Killian. Phil Slater is steadily progressing as a leading actuary for the Equitable Life in New York."

Eli is vice-president of his company and his address is The Great Eastern Life Insurance Company, 10 Dorrance Street, Providence 3, R.I. How about sending in some news? — JIM LEARY, *Secretary*, Indian Harbor, Greenwich, Conn.

## '37

John Jacobs reports: "I'm working at Stone and Webster as a process engineer. Living on Beacon Hill in a very old house at 69 Joy Street. Would like any '37 classmates to drop in at any time or come for dinner. Playing tennis and squash at M.I.T. about three or four times a week. Spent all of July on the Tangier sailing from Annapolis to Boston and cruising in the Nantucket and Vineyard region. Boat now at Long Wharf for winter. Daughters Karen in Mexico, Jeep at Cambridge Academy."

Joe Sousa, Phil Bliss, Harry Goodwin and Bob Harris are the latest additions to our growing list of those planning to attend our 25th reunion. Return your cards and let us know your plans and especially any suggestions. — ROBERT H. THORSON, *Secretary*, 506 Riverside Avenue, Medford, Mass.; S. CURTIS POWELL, *Assistant Secretary*, Room 5-323 M.I.T., Cambridge, Mass.; JEROME SALNY, *Assistant Secretary*, Egbert Hill, Morristown, N.J.

## '39

Our esteemed class treasurer, Ernest R. Kaswell, broke into the news recently with the announcement that he has been elected president of the Fiber Society, Inc. This society, I learned from the announcement, is the textile industry's fundamental scientific research association, and is dedicated to the advancement of scientific knowledge pertaining to fibers, fiber products, and fibrous materials. Ernie ought to fill that new post with aplomb; as many of you know, he is president of Fabric Research Laboratories, Inc. Ernie and another Tech man, Walter J. Hamburger'21, founded F.R.L. in 1942. Incidentally, I enjoyed a pleasant Christmas card from Ernie and Yolande. The Kaswells live at 58 Larchmont Avenue, Waban, Mass.

Not always is it the classmates who make the news. In this case it's a loyal wife. Mrs. Richard H. Kaulback has been named editor of the New Wilmington, Pa., *Globe*, a weekly newspaper which prints much of

the Amish (Pennsylvania Dutch) news of that part of the state. Dick, originally from Malden, Mass., is a research metallurgist in New Castle, Pa. The Kaulbacks have three children, James, 14, Jean, 11, and Bob, 9.

A short note gave the interesting address of George William Beer, XII. Bill can be reached through Esso (Sahara) Inc., 126 Ter Rue Michelet, Algiers, Algeria. He is chief geologist and exploration manager for Esso Sahara. . . . Albert Heath Chestnut, industrial engineer for Buffalo Forge Company, Buffalo, N.Y., has recently encountered some unexpected engineering problems at home. He and Helen and their two daughters Ann and Mary, ages eight and six, respectively, were joined in January by twin boys James and David. Result? The Chestnuts moved around the corner into a bigger house!

Here's news, too, from the other Chestnut, Harold. Hal writes from 812 De Camp Avenue, Schenectady 9, N.Y., where he's helping General Electric. (Sorry I cannot be more definitive about Hal's work, for he really wasn't writing me with class notes in mind. He and Erma have a legitimate growl about a missing link in our recent 20th reunion activities: apparently none of us has yet received our group photograph even though we had made the payment to the photographer at the time. Doc Wingard, please note, and act, and fast! Thanks, Hal, for the reminder.)

More Christmas card sources help with these notes: Maynard and Kitty Drury have five children: Walter, Mary, Esther, Jack, and Carol. (The Drury card didn't mention anything about their several thoroughbred dogs, nor their chickens, cows, or other miscellaneous farm animals at their Locust Valley, Long Island, suburban farm home.) Maynard, believe it or not from this impressive array, commutes to New York City, where he is with American Smelting and Refining Company.

Another five-children family among '39-ers is Brownie Parker. He and Lucy proudly present Cindy, Lyn, Theo, Sophie, and Ben. Brownie heads up the research activities at Dewey and Almy Chemical Company, in Cambridge. The Parkers live in Wayland, Mass., in an unusual home of Brownie's own design and construction. (It's pretty hard to get Brownie to leave that fine home. Word had it at the 20th reunion that he couldn't come down to Harwichport because he was so busy constructing his *second* swimming pool.)

Bob and Dodie Casselman enclosed in their card a snapshot of their entire family, including their handsome teenagers Margie, Carl, Ted, and Fritz. Needless to say, the photograph was a Polaroid picture of the family; Bob is vice-president and sales manager for the Polaroid Company. (For those of you who didn't attend the 20th reunion, there's a treat in store for you at the 25th; Bob does tricks with his trio of Polaroids, and brings down the house during the evening entertainment with comical versions of montaged photos.)

I'll save a couple of more Christmas card messages for next month's notes, including details of Fred Cooke's current Navy assignment in the missile field. But I shouldn't postpone congratulations to Fred — and Eugenie — on his new promotion to the rank of captain! How about a resolution

to send an item or two about *your* current activities? Names make the notes; no news, no notes. — OSWALD STEWART, *Assistant Secretary*, 31 Birch Road, Darien, Conn.

## '40

It is with regret that I must write of the death in June, 1958, of Harold Robinson, a former member of Course XIX. No further details are available.

Clark Goodman is now vice-president of techniques at Schlumberger, Ltd., in Houston, Texas. . . . Jack Danforth advises that there was a contribution of \$1,000 from a member of our Class to the Alumni Fund this year. This should start us on our way to having the best Alumni Fund year that '40 has experienced so far. . . . Andrew Bayle has been elected vice-president of engineering at the Waltham Precision Instrument Company. Previously, Andy was director of engineering and has been in charge of the Satellite Clock, which is the popular name for a chronometric programmer for Project Mercury.

John Scalzi, who is associate professor of civil engineering at the Case Institute of Technology, is in charge of a research team which is attempting to measure the "load on your feet." The answers they come up with will be of value to surgeons in demonstrating how much of a load is placed upon broken bones in the leg, and will also be useful to the manufacturers of shoes, and, of course, to the public who wears them. . . . Don't forget the reunion at Chatham Bars Inn, beginning June 10. Undoubtedly, you will be receiving information from Bob Bittenbender before this issue of *The Review* reaches you. — ALVIN GUTTAG, *Secretary*, Cushman, Darby and Cushman, American Security Building, Washington 5, D.C.; SAMUEL A. GOLDBLITH, *Assistant Secretary*, Room 16-325, M.I.T., Cambridge, Mass.; MARSHALL D. MCCUEN, *Assistant Secretary*, 4414 Broadway, Indianapolis 5, Ind.

## '41

John Kraus has been appointed industrial engineer for the fuel systems works, Tapco group, of Thompson Ramo Wooldridge in Cleveland. John has been with T-R-W since 1941, and has been responsible for the establishment of the packaging laboratory and the development of many quality control procedures now used by the organization. . . . Loren Brunner, a captain in the Coast Guard, was awarded the Legion of Merit for his work on the development of Loran C, which resulted in a system 10 times as accurate as previous systems. Also involved was the development of a computer to convert Loran information to director finder capabilities, plus installation of new Loran stations along the East Coast. The presentation was made by Treasury Secretary Anderson on behalf of President Eisenhower; among others present was Theodore Fabik, now Coast Guard assistant engineer-in-chief.

Christmas cards came from Warren Meyers, Carl Aronsen, Joe Quill, Bob Montana, and Dot Fox. Dot reports that

Bill went back to work full time in October, and is recovering satisfactorily from his lung troubles of a year ago. Glad to hear it, Bill; keep up the progress. Carl Aronsen, normally based in New York, has been making weekly trips to Cohoes, N.Y. (near Albany), supervising the construction of a tug being built there. Sorry he didn't get to see us; we're just over the state line from there.

Elliott Buell, of the Worcester Polytechnic Institute, mathematics department, and chairman of the computing center committee, has been named department head, effective July 1. Before joining W.P.I. in 1957, he had been on the mathematics and physics staff of Northwestern University, lecturing in electrical engineering and specializing in machine computation, and serving as technical director of the aerial measurements laboratory there. . . . William Hajjar, on the staff of Pennsylvania State University for the past 12 years, is at present professor of architectural engineering, and is studying the possibilities of using glass for walls and other structural parts of buildings.

Dirk Van Dongen, the globe-trotter of Course II, is reported to be in Managua, Nicaragua. . . . Twentieth reunion dates are Friday, June 9, through Sunday, June 12, 1961. Make plans now to attend! — IVOR W. COLLINS, *Secretary*, 9 Sunnyside Drive, Dalton, Mass.; HENRY AVERY, *Assistant Secretary*, Pittsburgh Coke and Chemical Company, Grant Building, Pittsburgh 19, Pa.

## '42

David B. Nicholson has been elected vice-president in charge of engineering at Kollsman Instrument Corporation in Long Island, N.Y. During his 14 years with Kollsman Dave has been primarily concerned with research and development of automatic celestial navigation equipment and military computation systems. Previous to this he had been with the radiation lab and in the Electrical Engineering Department at the Institute. Dave and Arline with their children, Laurie and Brad, live in Great Neck.

An announcement from the Ronald Press of New York tells us that Professor William Dennen, of the Institute's Geology Department, has just authored and published a book, "Principles of Mineralogy." It covers such mineralogical phenomena as isomorphism, polymorphism, exsolution, and twinning, and serves as a good background for studies in solid state work, crystallography, crystal chemistry, petrology and geochemistry. Bill is a Fellow of the Geological Society of America and holds memberships in the Geochemical Society, the Society for Applied Spectroscopy, the Association of Geology Teachers and Sigma Xi.

Sutton Monro has been appointed associate professor of industrial engineering at Lehigh University in Bethlehem, Pa. For the past eight years he was with the Bell Telephone Laboratories; before that taught at the University of Maine, and did graduate work at the University of North Carolina. He is a member of the American Statistical Association, the American So-

ciety for Quality Control, the Institute of Mathematical Statistics and Sigma Xi.

By the time these notes are published William D. McGuigan will have presented a paper and led an American Management Association seminar at a conference on Capitalizing on Technology. Bill's subject is "Research Risks." . . . William J. Knapp, professor of engineering at the University of California, recently presented a paper entitled "Activities and Structure of Some Melts in the System  $\text{Na}_2\text{SiO}_3\text{--Na}_2\text{Si}_2\text{O}_5$ ." It has been published in the *Journal of the American Ceramic Society*.

The General Motors engineering staff has announced the appointment of Lothrop M. Forbush as engineer in charge of the vehicle development group. After receiving his S.B. from Harvard, Lothrop took courses at Tech, was a design engineer for United Shoe Machinery and served in the Coast Guard until he retired with the rank of captain. At G.M. since 1946, he has been concerned with engineering developments in structures and suspensions as well as overall vehicle design. . . . Arthur A. Hauser, director of technical planning at Sperry Gyroscope Company, is the author of the paper, "Electrical Linkages for Computing Equipment," which appeared in *Automatic Control*.

As has been a tradition for some years past, Al and Shirley Goldis were gay New Year's Eve hosts to a delightful group that included Erma and Marvin Epstein, Thelma and Stan Golembe, Irma and Marty Levene, Elaine and Milt Platt, and Janine and Arnold Shapiro. The consensus of careful (?) late night observation was that your secretary's waistline is not what it used to be. Except for a five-minute conversation with Ep about the mathematical analysis work he is doing at the Bell Telephone Laboratories, news was hard to come by from this always articulate and very productive group. The best I could do was to get a short report on the rising curve of bowling scores from those still young enough in physique to bowl every Tuesday.

Colonel Arthur K. Swanson is now at the Industrial College of the Armed Forces in Washington, D.C.; Commander John B. Jorgensen is at the Naval Air Station, Patuxent River, Md.; Walter J. Robbie has moved to Pittsfield, Mass.; and James L. McClellan, Jr., has moved to Grosse Pointe Farms, Mich. This has been a relatively slow and quiet month except for the few fine promotions recorded above. We trust that each and every one of you will drop us a post card when promotions are announced, papers are presented, or books are published. The Institute's clipping service works very well but is understandably slow — an extra copy of your company's press releases direct to the address below will speed up the process and accomplish the communication we would all like to see.

A welcome to the new decade from — J. J. QUINN, BOB KEATING, ED EDMUNDS and LOU ROSENBLUM, Tech/ops, Burlington, Mass.

## '43

We missed the last issue of our notes because the correspondence was quite light, but the news items have accumulated, so

here they are. Hamilton Herman of New Canaan, Conn., has been elected a vice-president of American Machine and Foundry. He is director of their research and development division for proprietary products, and joined AMF as assistant to the divisional vice-president of the company's tobacco division in 1955. Prior to that he was a special assistant to the president of M.I.T., where he had been manager of the M.I.T. flight facility. . . . Bob Meissner has been named president of Meissner Engineers, Inc., of Chicago. The firm was founded in 1949 by Bob and his father, as an outgrowth of the elder Meissner's work as a consultant. Bob will assume full responsibility for the firm's divisions on industrial process plant design and bulk materials handling, and their civil engineering, including highways, major bridges, flood control, and sewage disposal.

Bob Handelman has been appointed general manager of the newly established systems division of Kearfott Company, Inc., Little Falls, N.J., an aircraft instrument concern, where he will be responsible for research, development, and production of high-precision instrument systems for the guidance and control of aircraft and missiles. He has been with Kearfott since 1947, and was formerly chief engineer of their Bludworth Marine Division. . . . Frank French, Jr., has been appointed to the newly created position of manager of new product and market development in DuPont Company's "freon" products division. Frank received his doctor's degree in chemical engineering in 1948, and has been with DuPont since then.

Vic Darnell stopped in recently, and told me that Tom Dyer has been made chief engineer of the Boston and Maine Railroad. This doesn't mean that you Boston North Shore commuters should look anxiously in the engine cabs for Tom; you'll find him at 150 Causeway, instead. Vic, by the way, is keeping quite busy at Berlin Construction Company here in Connecticut, fabricators, designers, and erectors of structural steel for large industrial works, and he's also taken on the task of chairman of his church's building committee for their new edifice.

Morris Rosenthal was in West Hartford recently, and he told me of his new association as project engineer with Waltham Electronics Corporation. He lives in Sharon, Mass. . . . Gene Eisenberg and his family were in West Hartford during the Christmas holidays. Gene, who is with Lilenthal and Becker, consulting engineers in Boston, has been taking graduate work in structure design, and may be adding another degree soon. . . . W. D. Van Vorst, who is a member of the engineering staff at the University of California, co-authored a paper on ceramics with W. J. Knapp, '42, which appeared in the November, 1958, issue of the *Journal of the American Ceramic Society*.

If you read the financial section of the *New York Times* on January 3, then you are up to date on Joe Tankoos, who was featured in their "personality" article which appears on page 3. But for the distant ones, let me review what it said. Joe worked as an engineer for Sperry Gyroscope and then for Fairchild Aviation after leaving Tech. During World War II he

was in the American Field Service in Italy. Following that he was in advertising and public relations until 1948, when he joined his late father's firm, Tankoos and Company, a leading Manhattan real estate concern. From then on Joe became very active, and it seems that now he can't be stopped. One day he had an occasion to seek out Canadian real estate for some clients. The deal didn't materialize, but while in Canada he met Elliot Yarmon, a Canadian broker. They joined forces and before long had worked out some very substantial leases, culminating in the formation of Tankoos Yarmon, Ltd., which specializes in real estate sale-and-leaseback deals, combined with a modified form of realty syndication for large investors. They were intermediaries in the purchase by Webb and Knapp of 277 service stations of Canadian Petrofina, Ltd., for \$12,500,000. Later they decided to act as principals, either solely or as heads of investing groups. Joe's company has acquired more than 140 million dollars of Canadian real estate in the last four years, and today asserts it has control of 50 million dollars worth of property extending from the Maritime Provinces to British Columbia, yielding returns as high as 17 per cent and averaging 10 per cent. Joe lives in Beekman Place in New York, but spends his weekends in Palm Beach, at the Colony Hotel, which his firm recently acquired.

Change of address cards show that Dave Falk, who is a major in the Air Force, moved from Virginia to Canoga Park, Calif., and Jim Reswick moved from Cambridge to Cleveland Heights, Ohio. Assistant Secretary McDonough's new address appears below.—RICHARD M. FEINGOLD, *Secretary*, 10 North Main Street, West Hartford 7, Conn.; *Assistant Secretaries*: CHRISTIAN J. MATTHEW, Arthur D. Little, Inc., 314 Battery Street, San Francisco, Calif.; JOHN W. McDONOUGH, JR., 413 North Miami Street, Wabash, Ind.

## 2-'44

I received a note that Thiel College in Greenville, Pa., has appointed Lenore E. Brooks Naqvi as visiting lecturer in mathematics. After M.I.T. Lenore took her M.A. at Boston University, and then did postgraduate work at Radcliffe. Before moving to Greenville, Dr. Naqvi served as a lecturer in the department of education, University of Sind, Pakistan, for three years. . . . A note advises that John W. Hoopes has become director of the chemical engineering department in Atlas Powder Company's chemicals division. After leaving Tech John took a master's degree and doctorate at Columbia, where, I believe, he also did some teaching.

Ran into Fred Hopewell and Pete Matthews at an Instrumentation Society meeting a couple of weeks back, and they both report that they are with the M.I.T. Instrumentation Laboratory. Fred is a group leader and reports that his major outside activity is an active part in the M.I.T. Faculty Pistol and Rifle Club. It appears that this group is quite active in the winter, with 14 meets scheduled this winter season. He reports the family consists of his wife, his son, 10, and daughter,

13. Pete advises that his family, two boys, 11 and 9, and a daughter, 3, is doing fine in Needham. Since the reunion he has become active on a program for the complete remodeling of the inside of the Sigma Nu house in Brookline. From his description, it is going to be quite a major job.

Also ran into Fran LeBaron, who now has a Ph.D. in biochemistry. He has an appointment at Harvard where he is doing research in his field. He is also doing work in biochemistry of the brain at McLean Hospital in Waverly, Mass. A couple of years ago he visited Vienna and Strasbourg, while attending the International Biochemistry Congress. The big plans now are to attend the same congress that is to be held in Moscow in 1961. . . . I don't know if the other members of the Class noticed, but the January issue of *The Technology Review* showed a picture of the M.I.T. Club of Southern California's board of governors, and it appears there are three members of the Class present: Bob Copsey as vice-president, Gary Loomis as treasurer, and Vic Stanley as a member, probably keeping the other two from running through too much legislation at one time.

Got a call in early December from Lew Tyree who was in town on business. He said that all is well in Chicago, and that he will try to drop me some notes when he runs into the other members of the Class. . . . J. B. Gardner dropped me a note asking for a couple of addresses and volunteering the information that he had prints made of a number of the "sports" taken at the last reunion. He said that the negatives are for sale at a price to any "friend" (Ed's quotes) not above dealing with a blackmailer. As for personal information he advises that he is assistant chemical engineer of the Kerite Company in Seymour, Conn., making insulated cables. Wife Dorothy and two youngsters live in a tech-built home and are only a few minutes from the west end of the New Haven tunnel on the parkway, so would heartily welcome a call and a visit from classmates passing through the area. He recently saw Harvey Sommer, Dick Maconi, and Don Phillips.

Bob Bartz put a note on his Christmas card saying that he's transferring to Boulder, Colo., where he'll be the new director of Associated Rocky Mountain Universities. . . . As a parting thought, I will be very happy to help any members of the Class locate other members if you will drop me a note. The Institute has a very good file, and they are most helpful.—PAUL M. HEILMAN, *Assistant Secretary*, 66 Central Street, Wellesley, Mass.

## '45

As of January 4 we had received 62 answers to our reunion-dues flyer of December 1. Not enough! By the time you classmates read these items I hope this number has at least quadrupled for we should conservatively expect a 50 per cent response. Actually our initial mailing was to some 700, which represents any and all associated with our Class with the exception of those who have specifically asked to have their names stricken from the rolls. Our active class membership is about 465

and is made up of all degree holders plus any non-graduate who has contributed to the Alumni Fund at any time through the years.

The data contained within our brief questionnaire will be expanded into paragraphs of flowery rhetoric in the months to come but from now until June 10 this column shall be primarily devoted to your 15th reunion. The following classmates are planning to be at the Snow Inn in June and they are looking forward to renewing your acquaintance: Tom and Betsy Hewson, Hap and Nancy Poole, Charlie and Janet Patterson, Chris and Jean Boland, Pete and Lou Hickey, Jack and Sarah Leonard, Bill and Elaine Shuman, Dick and Barbara McManus, Jerry and Lib Patterson, Tom and Jimmie Stephenson, Ed and Elinor Stoltz, Chick and Helen Marie Street, Bill Meade, George and Donna Davis, Bob and Nina Wilson, Jerry Quinnan, Bob and Ruth Gould, Dave and Mary Trageser, Isaac and Margaret Goodbar, Andy and Anne Marocchi, Doug and Mildred Esten, Jim and Ellen Brayton, Max and Trudy Ruehrmund, Alvin and Devarha Cohen, Bob and Carol Welch, Spence Standish, Bill and Judy Blitzer, Bill and Betty McKay, Clint and Frannie Springer, Chuck and Jeff Buik, Nick and Rosemary Mumford, Jake and Kate Freiberger, Guy Gilleland, John and Carol Gaffney, Tom and Louise McNamara, and from far off Arizona Jim and Mary Hoaglund.

Hopefuls at the moment include Julian and Lois Busby, J. J. and Edie Strnad, Vince Butler, Bob Hildebrand from Seattle, Jack Thompson and Mary Sullivan Nesbida. If your name is not included let us hear from you promptly for as you can see, many of your old buddies will be on hand. To those of you planning to attend who note the name of an old friend not attending, drop him a line and light the necessary fire. The more the merrier and we want to be merry!

Each year the Alumni Association publishes a directory which lists all those active in the association. The Class of 1945 is represented officially on the Alumni Council by Bill McKay with Dave Flood, Dave Trageser and Jerry Quinnan sitting in as well. Mrs. Freida Omansky Cohen is president of the M.I.T.'s Women's Association. M.I.T. club officers are Mario R. Wunderlich, president—Guatemala; F. H. Li, secretary-treasurer—Hong Kong; Henri A. Audet, vice-president—Montreal, Quebec; Thorn Smith, vice-president—New York; Ed Stoltz, treasurer—Pittsburgh; Educational Council Representatives include Vince Butler, San Francisco; Dave Flood, Natick, Mass.; Warren Miller, Buffalo; Tom Stephenson; Al Oxenham, and Ed Stoltz, Pittsburgh.

In the January issue I indicated that John Vozella had moved to Reading, Mass.; now I know why! John is manager of service engineers at Polaroid on Route 128 in Waltham. . . . Doug Esten is at it again, for late last year he received his second sustained superior performance award at the Army engineer's station, Fort Belvoir, Va. Keep up those maps Doug.

Possibly our roving area reunion blood hounds will induce your 15th reunion attendance if that letter from an old friend did not stir your spirits. The reunion will

not be complete unless you attend. May we plan on you? — C. H. SPRINGER, *Secretary*, Firemen's Mutual Insurance Company, 420 Lexington Avenue, New York 17, N.Y.

## '46

If you can spare a moment from the intricacies of income tax computations you may find the following notes interesting. Jan and I received some nice Christmas cards from various members of the Class, and the first to arrive was from John Taylor and Nancy, in Baltimore. John has an interesting idea and I'll quote directly: "With the wintry wind beginning to blow, my thoughts turn to Bermuda." John and Nancy vacationed there a year or so ago and really enjoyed it. "How about putting an item in *The Review* inquiring how many would be interested in holding our 1961 reunion there? Groups at our plant have been chartering flights to Europe for \$260 round trip on Pan Am, so we should be able to get to and from Bermuda for well under \$100. Once there, the accommodations are much less expensive than the Hotel Lenox or Cape Cod. Let's give the idea a try to see if there is enough favorable reaction to such a combined vacation-reunion. Wouldn't you too be interested? I'll be glad to make further inquiries if you think it desirable to be more definite." John, I think the idea has interesting possibilities, and by means of this article I request all who read this and who might be interested in such a plan, assuming costs are reasonably close to your estimates, to contact your secretary and inform us of your feelings. If you don't like the idea, your comments will be equally welcome, and any alternative suggestions you may have will be appreciated.

Another card was received from Ken Davis containing much news of his doings plus a news clipping from an IBM newspaper. Ken joined IBM in 1949 as a member of the San Francisco sales force and advanced to become manager of the Bakersfield branch in 1953. Following successive assignments as manager of methods at Endicott and Washington headquarters, and as administrative assistant in the office of the executive vice-president, he was advanced to controller for the special engineering products division in 1956. He has just been appointed controller for IBM's federal systems division, with his office in Washington, D. C. The division he is now with is responsible for all of IBM's government business. Ken, Corinne (no age given), Andy (8) and Barbara (6) have just moved into their new house, 9119 Aldershot Drive, Bethesda, Md. After the initial concern about leaving their old home in New York, Corinne and the girls have apparently grown to like their new home. . . . One other card received was from the Herb Hansells with pictures of their two boys and very cute girl. Thank you all for your greetings.

One of the painful tasks of this job is reporting the deaths of classmates. We just received word of the death of Maurice V. Joyce, Jr., on December 7, 1958. Maurice started with our class in Course VI. His most recent home was at 115 Glenview Drive, Belleville, Ill.

Louis B. Wadel writes to inform us of his new position as chief of advanced electronics, Vought electronics division, Chance Vought Aircraft, Inc., Dallas, Texas. His home is still at 3546 Caruth Blvd., Dallas 25, Texas. . . . Carroll J. Brown, who makes his home at Dawn Harbor Lane, Riverside, Conn., has been named executive development advisor of Standard-Vacuum Oil Company, White Plains, N.Y. Carroll received his B.A. from Oberlin College (Ohio) in 1940 and his master's in Industrial Management from M.I.T. For the past five years he has served Standard-Vacuum on a full-time basis as organization consultant, participating in management studies in Indonesia and Africa, and has helped shape the company's executive development program. Before joining Stanvac he was engaged in industrial engineering work with U. S. Steel for five years. In 1946 he became a member of the M.I.T. teaching staff and two years later was appointed to the Faculty as an assistant professor. He taught industrial production, organization and technique of executive controls. Carroll also developed and taught a graduate seminar in public relations. During his nine years at M.I.T. he undertook management consulting assignments with the Ford Motor Company's international division, the American Arbitration Association, the Federal Mediation and Conciliation Service, and Standard-Vacuum. The Browns have two children, Jonathon 15 and Elizabeth 9.

Clifford C. Woods graduated from Course X at M.I.T. and went on to Columbia where he earned his master's degree in business administration in 1950. He has recently been appointed an assistant vice-president of the First National City Bank of New York. Clifford makes his home at 47 North Ridge Road, Old Greenwich, Conn. That's all for this month. Don't forget to write your comments on the reunion, to — JOHN A. MAYNARD, *Secretary*, 15 Cabot Street, Winchester, Mass.

## '48

As winter wanes, can spring be far behind? Actually, this has been a wonderful season for winter sports, and I hope all my ski enthusiast friends have enjoyed it as much as I. In addition to good skiing in the New England area, I managed to squeeze in a weekend at Arosa, Switzerland, in January during a European business trip.

I am pleased to note a number of promotions which have come to my attention this month. John Winninghoff has been appointed to a sales post with the Aeroflex Corporation in Long Island City. John was formerly sales director of the Perkin-Elmer Corporation, E-O division in Long Island City. . . . General Motors has announced the appointment of Don Atwood as Assistant Director of its new AC sparkplug research laboratory in Wakefield, Mass. Don has been with AC for a number of years as a consultant. . . . Late in 1959, Warren King was appointed managing editor of *Fleet Owner*, a McGraw-Hill publication. Warren has served the company in several capacities since 1953. . . . The promotion of Frederic Foss to manager of advance systems research has been announced by IBM's

federal systems division. Fred has been with IBM since 1950 and most recently has been serving as manager of navy systems research. . . . I have received an announcement that Nicholas Prasinos was recently recommended for admission to the bar. I hope by now that his application has been favorably acted upon. Nick was graduated cum laude last June from Suffolk University Law School.

Jay Lathrop has been awarded \$5,000 for his part in a research project to reduce complex electronic circuits to postage stamp size. He was one of a team of five Army scientists to receive the award and all are employees of the Diamond Ordnance Fuze Laboratories on the grounds of the Bureau of Standards in Washington, D. C. . . . For readers who are interested in high-temperature technology, W. D. Kingery has recently published the following book, "Property Measurements at High Temperatures: Factors Affecting and Methods of Measuring Material Properties at Temperatures Above 1400° C. (2550° F.)."

D. J. Blickwede, division head, research, Bethlehem Steel Company in Bethlehem, Pa., contributed a paper, "Continuous Annealing of Deep Drawing Sheet," to the initial publication of the *Metallurgical Society Conferences*. The American Institute of Mining, Metallurgical, and Petroleum Engineers is going to produce a series of volumes on the proceedings of technical conferences of the Society or of its technical committees. . . . The November issue of the *Journal of the American Ceramic Society* has an article by R. E. Mould, research vice-president of Preston Laboratories, Butler, Pa. He collaborated on a paper entitled "Strength and Static Fatigue of Abraded Glass Under Controlled Ambient Conditions: I. General Concepts and Apparatus." This was followed up in the December issue with part II: "Effect of Various Abrasions and the Universal Fatigue Curve."

Bascom Birmingham is making an important contribution to international cooperation in high-energy nuclear physics research. He has been engaged as a consultant, along with three others, by a group co-ordinated by the Imperial College of Science and Technology of London, England, working on the British National Bubble Chamber. . . . The Fulton-Irgon Corporation of Dover, N.J., was recently acquired by the Lithium Corporation of America. Joseph Irgon, present Fulton-Irgon vice-president, is a recognized authority in the field of rocket propellants. . . . Bob Sandman of Waban, Mass., has been elected president of the New England chapter, National Industrial Service Association. N.I.S.A. is a national organization of electric motor repair shops.

Of social interest was the wedding last fall of Miss Maria Pappajohn and John Dulchinos in Boston. John is a project engineer for Advanced Industries in Boston. . . . I had an interesting letter a while ago from Bob Gurney, who has been associated with Cal Tech for four years. He is presently with their seismology lab. For extra-curricular activity, he is developing a light-weight catamaran racing sailboat. . . . From the Alumni directory for 1959-1960, I have some information for the statistically-minded among us. There are 64 Alumni active in Alumni affairs, not in-

cluding officers and assistant officers. Thirteen of these are active as officers of M.I.T. clubs at home and abroad, 41 are members of the Educational Council of the Institute, four as honorary secretaries, and three as regional chairmen. — RICHARD H. HARRIS, *Secretary*, 26 South Street, Grafton, Mass.

## '49

An article in *The New York Times* on January 10 reports that Dr. Otto E. Kirchner, a Boeing scientist, is directing a study entitled "Journey's End." The study is aimed at uncovering any hidden patterns in aircraft accidents during approaches and landings. The study has been undertaken by the Flight Safety Foundation, a non-profit research organization, and is sponsored by American Airlines, the Boeing Airplane Company, a group of insurance companies, and the Airline Pilots Association. Good luck Otto, from one of a large group of heavy consumers of aircraft mileage.

I received an announcement from Claremont, Calif., of the birth of Jane Elizabeth Piness on November 24, 1959 — third child, first daughter, of Mr. and Mrs. George Piness, Jr. . . . John Kunstadter writes that he and Geri would like to see the reunion pictures if they are ever available in the Chicago area. Unless he escapes to England or the Caribbean, John has volunteered to handle the details of a Chicago showing. As of mid-January, the start of these showings awaits only some dedicated organizing activity on the part of Russ Cox and Kemon Taschioglou.

From Brooklyn comes an announcement of the engagement of Lorraine Brooks to Eugene M. Wroblewski. A January wedding is planned. Miss Brooks is an alumna of St. Brendan's, attended St. John's University, and is now assistant treasurer of American and Foreign Enterprises, Inc., in New York. Gene is liaison engineer for the Minneapolis Honeywell Company. . . . Harold G. Ingraham, Jr., became a Fellow in the Society of Actuaries this fall. He is now with the Massachusetts Mutual Life Insurance Company, Springfield, Mass.

Walter E. Mutter (Ph.D., Physics) is a senior engineer in the semiconductor development organization of the IBM Product Development Laboratory, Poughkeepsie, N.Y. . . . Thomas H. Martzloff (M.S., School of Industrial Management) is assistant to the president of the Acme Brick Company in Fort Worth, Texas. He comes to this newly-created position following 10 years with the San Francisco office of McKinsey and Company, Inc., a national management consulting firm. . . . Nisson A. Finkelstein (Ph.D., Physics) has been appointed assistant vice-president and director of research of the Stromberg-Carlson Division of General Dynamics Corporation. . . . Recent correspondence on my part regarding a forthcoming AMA meeting uncovered Andrews M. Lang as assistant director of programs at the AMA Academy in Lake Saranac, N.Y. Sounds like a nice assignment in pleasant surroundings.

The remainder of this column is devoted to a second covey of classmates. I remind you that the present tense refers to spring,

1959, and that the listing, while alphabetized for each issue, is not basically alphabetical. David duBose Gaillard, II, lives at 1970 Upshur Street, N.W., Washington 11, D.C. He received a B.S. in General Engineering in Course IX, Option B; and an M.B.A. from the Harvard Business School in 1951 in manufacturing. He is an investment analyst and manager of D. P. Gaillard, managing its investment portfolio, making statistical studies, charts of individual stocks, and estimated timing of general stock market moves. Hobbies: sailboat racing, golf, skiing, swimming, bridge; past president of local citizens association. Married (Barbara), three children — two boys nine and seven, girl four. Pets: two cats. Owns home in urbia. Has held two jobs since graduation.

James P. Gordon lives at 575 Main Street, Chatham, N.J. (Apt. 3C). He received a B.S. degree in Course VIII; and a Ph.D. from Columbia University in 1955 in physics. He is a member of the technical staff of the Bell Telephone Laboratories; a sub-department head in charge of a small research group in the electronics research department. A bachelor, hunting variety, he lives in an apartment in suburbia. Has held one job since graduation.

Robert S. Griggs lives at "Finca Mil Robles," Guaynabo, Puerto Rico. Mail address: P. O. Box 4224, San Juan, Puerto Rico. He received a B.S. degree in both Course XVII and Course I and the degree of Juris Doctor in law from the University of Michigan Law School in 1952. A partner in the firm of McConnell, Valdes and Kelley, he practices law, principally corporate and tax, in San Juan. Married (Jay), three daughters ages ten, eight, and three and one unknown gender on the way. He traveled 1,850 miles to reach last year's reunion.

J. S. Harford lives at 210-04 32 Avenue, Bayside, N.Y. He received a B.S. degree in Course II, Option heat and power, and is presently employed by the Niagara Blower Company in New York City as a sales engineer. Married (Dora), he has two daughters, ages six and four, owns his own home in urbia, and has held three jobs since graduation.

William C. Howlett, President, Union Iron Works Company, lives in his own home in exurbia with his wife Virginia, three daughters aged six, two, and eight months and a son five years, a dog, two ducks, and several thousand bees. He has held two jobs since graduation. He received a B.S. degree in Course II.

Frank T. Hulswit lives at 14 Nadine Road, Saxonville, Mass. He received a B.S. degree in Course VIII, followed by graduate work in Physics at M.I.T. Presently employed at Arthur D. Little, Inc., operations research section, his duties are varied, in the consulting and industrial problem-solving fields. Married (Sonya); daughter, eight, son five; owns own home in suburbia. Has held two jobs since graduation (or 25, counting consulting assignments).

D. L. Gillespie lives at 14 Main Street, Concord, Mass. (his own home in suburbia), with his wife, Lee, three daughters eight, six, and six months, and a son four years. Their pets include a dog, a parakeet, and a turtle. He received a bachelor of architecture degree in Course IV, and is now manager of an architectural office. He has held four jobs since graduation.

William Haddon, Jr., lives at 31 Euclid Avenue, Delman, N.Y. He received a B.S. degree in Course XX, an M.D. from the Harvard Medical School in 1953, and an M.P.H. in epidemiology (magna cum laude) from the Harvard School of Public Health in 1957. He holds two jobs: 1) Director, Driver Research Center, New York State Department of Health—Bureau of Motor Vehicles, and 2) Director, X-Ray Usage Survey, New York State Department of Health. His duties are: (Job 1) a. obtaining, organizing, and administering the medical consultation services used by the New York State Bureau of Motor Vehicles, and b. conducting research relative to motor vehicle accident causation. (Job 2) Research to determine the X-ray loads required by communities receiving high levels of medical and dental care. Married (Gene), one boy aged one year. Has held, depending on whether internship and academic research appointments are counted, two to six jobs since graduation. Rents home in suburbia.

Howard E. Hendershott, Jr., resides at 1070 Hereford Road, Cleveland Heights 12, Ohio. He received a B.S. degree in Course XV and an LL.B. in law from Western Reserve University in 1953. He is now an attorney in general practice with the firm of Hendershott and Hendershott. Married (Virginia), two girls, seven and a half and six, and two boys, four and a half and three. Owns his own home in suburbia. Has held two jobs since graduation.

Charles Holzwarth of 2355 Hempstead Road, Toledo, Ohio, received a B.S. degree in Course X, and an M.B.A. in business from Harvard in 1951. He is in merchandising with the National Lock Company. Married (Shirley), two girls, seven and one, and two boys, five and three. Has held two jobs since graduation.

John P. Horton lives at 79 Old Fort Road, Bernardsville, N.J. He received a B.S. in Course I and an Sc.D. in Course XI in 1951. He is now vice-president of the Newark Brush Company, doing a little bit of everything, but mainly engineering and production. Married (Jean Ann), two boys, eight and six, and one girl, four. Owns a home in the mountains. He has held three jobs since graduation.

Harold G. Ingraham, Jr., lives at 44 Fenway Drive, Springfield, Mass., his own home in suburbia. He received a B.S. in Course XVIII and an F.S.A. (Fellow, Society of Actuaries) in 1959 from the Society of Actuaries (passed nine competitive examinations). He is now a life insurance actuary with the Massachusetts Mutual Life Insurance Company, engaged in product research (design of premium, dividend scales), drafting of policy forms, systems to utilize data processing equipment in actual areas, handling annual statement problems. Married (Sandra), he has a boy three and twin girls nine months.

Charles W. Jackson of 228 Barron Street, Bensenville, Ill., received his B.S. degree in Course II. He is district sales manager of the Bendix Aviation Corporation, Red Bank Division, supervising transistor sales in the midwest area. Married, he lives in his own home in suburbia with wife Grace, a son, five and a half, and a daughter three and a half. He has held four jobs since graduation.

Harold E. Keene, 145 East Glenwood Drive, Birmingham 9, Ala., received a B.S.

in Course X. He is presently a sales engineer with the Improved Machine Company, Inc., doing sales, service, and design work. Married (Patricia Ann) and has two girls, aged eight and four. Lives in home in suburbia. He has held three jobs since graduation.

Edward M. Kerwin, Jr., lives at 3 Legion Road, Weston 93, Mass. He received a B.S. in Course VI-A, Option 4, an M.S. in Electrical Engineering in 1950, and an Sc.D. in Acoustics in 1954, all from M.I.T. He is now a consultant in acoustics for Bolt, Beranek and Newman, Inc., Cambridge, Mass., consulting on aircraft noise, industrial noise, vibration, appliances, machines, and so forth. He is also doing research on mechanical vibrations and structure borne sound. Says he loves his work, but would also love to have a sabbatical! Married (Margaret Ann), three children, boys four and three, and a girl eight months. Lives in the country, and has held one job since graduation.

Geri Kunstadter (Mrs. John), 1236 Asbury Avenue, Winnetka, Ill., since leaving Course VI, has worked for the Institute for Nuclear Studies at the University of Chicago (summer 1948) on plans for the University of Chicago cyclotron built shortly thereafter. She also worked for the aircraft gas turbine division of G.E. at Lynn, Mass., in 1948-1949 as an engineering assistant. Her "present job—housewife; company—quite a bit; brief description of duties—impossible." She and John have four children, boys nine and three and a half, and girls six and 22 months. They have their own home in suburbia which also houses "dozens of goldfish."

John W. Kunstadter, also of 1236 Asbury Avenue, Winnetka, Ill., received a B.S. in Course VIII. He is now assistant to the president and director of the Formit Company, in the capacity of chief executive officer and managing director of foreign operations; supervisor of research activities; and general nuisance. Married to Geri, above, he lives in the same house in suburbia, with the same children, and, according to John, "countless guppies."

Malcolm H. Kurth lives at 35 Rockland Drive, Pittsfield, Mass. He received a B.S. in Course VI, Option: power. His present job is his only job since graduation, and is that of electrical design engineer for the G.E. ordnance department, designing and developing system controls for a naval missile handling and launching system. Married, he and Doris are suburbanites and own one cat.

Edward R. Lady, R.D. 3, Allentown, Pa., has an M.S. degree in Course II, and a B.S. in mechanical engineering from the University of Louisville in 1947. He is chief engineer, operations department, Air Products, Inc., with the technical responsibility of 13 oxygen plants located throughout the U.S.A. Married (LaVerne), two boys seven and five, and a third child on the way. Live in their own home in the country. Their only pets are five caterpillars belonging to No. 1 son.

Robert J. Lannamann, a sales engineer for C.D.B. enterprises, received a B.S. degree in Course XV, Option A. He is Philadelphia area representative for a New York agency handling several microwave lines—ANTLAB, BURMAC, PRD, FENWAL. He lives at 1403 Arnold Avenue,

Roslyn, Pa., his own home, in suburbia. Married (Barbara), with three children, a girl five and two boys four and one. He has held four jobs since graduation.

Ray E. Larson lives at 33 Watson Avenue, Attleboro, Mass. He received a B.S. degree in Course II, Option 2. He is superintendent of Larson Tool and Stamping Company, Attleboro, in charge of production and plant maintenance. Married (Muriel), one child, a boy of two years. Owns home in suburbia. Has held one job since graduation.

Albert A. Livingston, XV, lives at 3850 Wilshire Boulevard, Los Angeles, Calif. He is manager of the Los Angeles office of Home Life Insurance of New York; acts as sales manager of a team of professional life insurance men; plans estates as well as business and group benefit plans. Says of his work: "Getting into sales is the best thing that happened to me. The future is unlimited and I hope others will join me!" Married (Marjorie), two children, boy two and a half, girl seven. Owns home. Has held three jobs since graduation.

Walter H. Lewis, Jr., lives at 230 North Boulevard, West, Huntington, W. Va. He received a B.S. in Course XV, Option A. He is manager and secretary-treasurer for City Parking Port, Inc., as well as president of the Commercial Adjunct Company. These jobs involve the management of a family-owned parking garage and operation of his own ideal chain of parking lots. He comments: "I sometimes wonder how it happened this way myself!" He is married (Peggy), two children, boy four and girl two. Pets: one dog. Owns home in suburbia. Has held three jobs since graduation.

Joseph M. Lynch, Jr., lives at 575 Canton Avenue, Milton 86, Mass. He received a B.S. degree in Course XV, Option A. He is manager of the plastic sprayer and dispenser division of Arnold-Copeland Corporation, with responsibility for complete management of the separately incorporated subsidiary company, manufacturing plastic finger-tip sprayers and dispensers. Approximately \$200,000-\$300,000 annual volume, 50-75 employees. Married (Patricia Ann), has three children—two girls aged ten and a half and eight, boy of three and a half. Pets: dog, canary, goldfish. Owns home in suburbia, another in the mountains. Has held one job since graduation.

Stanley V. Margolin lives at 215 Grove Street, Auburndale 66, Mass. He received a B.S. in Course X, and an M.S. in Chemical Engineering in 1950, also from M.I.T. He is senior project engineer at Arthur D. Little, Inc., Cambridge. His work includes case leadership, client relations, and sales in metals and minerals processing area—heavily involved in research, technical, and economic studies. Married (Roslyn), three children, boy seven, two girls three and one and a half. Pets: one dog. Owns home in suburbia. Has held two jobs since graduation.

John L. McKelvie lives at 1028 Forestdale Road, Royal Oak, Mich. He received an M.S. in Electrical Engineering from M.I.T., took further courses in mathematics at the University of London, and digital computers at the University of Michigan. He is project engineer for Bendix Research Labs, Detroit, Mich. His work involves systems and equipment en-

gineering and numerical control systems. Married (Nancy), has three children, two boys six and a half and five, girl aged two. Pets: one dog. Owns home in suburbia. Has held three jobs since graduation.

Howard L. Millard lives at 217 Farm Lane, Westwood, Mass. He received a B.S. in Course I, Option transportation. He is part owner, treasurer, and chief engineer of Pilling Engineering Company, Inc., a civil, sanitary and consulting engineering firm. Also owns an architectural and structural design business; and he is building inspector for the town of Westwood. Married (Mary), five children, three girls, 12, six, one, two boys, seven and three. Owns home. Has held two jobs since graduation.

Russell L. Morris, X, lives in Brookhaven, Miss. (P.O. Box 334). He is the Mississippi and Alabama manager and engineer for the National Tank Company. He directs and co-ordinates all sales effort, field erection and installations, bookkeeping, inventory, transportation, personnel; makes all installation recommendations which are beyond the scope of the other salesmen; sells as much as possible; co-ordinates branch operations with general office and other branch activities. The company sells oil and gas production and transportation equipment; storage tanks constitute a small fraction of the business. Married (Susan), four children, three boys, seven, four and a half, two and a half, one girl age six. Pets: one dog. Owns home in country. Has held two jobs since graduation.

Herbert L. Neitlich lives at 25 Bantroy Road, Framingham, Mass. He received an M.S. from M.I.T. in Course XV, after getting his B.S. in industrial administration from Yale. He is a life insurance consultant for Metropolitan Life, handling sale and service of life insurance through estate planning and business needs evaluation. Married (Carole), one girl of four months. Pets: one dog. Owns home. Has held three jobs since graduation.

Leonard F. Newton lives at 90 Dempsey Avenue, Princeton, N.J. He received a B.S. in Course XV, Option A, and took further courses in the social sciences at New York University. He is research executive for Opinion Research Corporation. As account executive, he sells and services corporation and association accounts. Describing the company, he says: "O.R.C. is one of the leading market, attitude and motivation firms in the country. Our studies encompass all major corporate and association publics." Commenting on his education at M.I.T., he says: "The training in 'learning to think' which I received at M.I.T. has, of course, been of considerable value." Married (Ruby), two children, girl two and a half, boy one. Owns home in suburbia. Has held three jobs since graduation.

Mariano Ospina lives in Apartado Aereo 9187 Bogota, Colombia, South America. He received a B.S. in Course I from M.I.T.; then attended the Harvard Graduate School of Business Administration. He is assistant manager of Ospina and Company, Ltd., in charge of the technical department: topographical maps; sewer design on installation; design and construction of streets, water, and electricity facilities; community centers; and town planning. He describes town planning as "an all-embracing activity which requires some knowledge of civil engineering, design,

land economics, and so forth." Married (Helena), four children, two boys, six and three, two girls, five and one. Owns home in suburbia. Has held two jobs since graduation.

Lindsey R. Perry, V, lives at Sunrise Road, Boxford, Mass. He is product manager, computer tubes and hi-fi components for CBS Hytron. Married (Barbara), two boys aged four (twins?). Pets: one dog. Owns home in the country. Has held seven jobs with one company since graduation.

Richard K. Pitler lives at 14 Saradale Avenue, Albany 4, N.Y. He received a B.S. degree in Course III, then an M.S. in metallurgy from Rensselaer Polytechnic Institute in 1956. He is chief research metallurgist, high temperature alloys, for Allegheny-Ludlum Steel Corporation. He manages a laboratory of approximately 30 people working on high temperature alloy development, manufacturing methods development, and application of high temperature alloys to customer requirements. Married (Jeanne), three boys, six, four, one. Owns home in suburbia. Has held one job since graduation.

Barbara Feeney Powers lives on R.R. No. 1, Rockton, Ill. She received a B.S. in Course IX; took courses in education at University of Illinois. She is a homemaker and an occasional substitute teacher. Description of her duties runs the gamut from picking up clothes, washing dishes to cub scouts, ballgames, and so forth. She commented that she is able to make one trip East per year — usually July. Married, of course (Lee Haskell Powers'50), five children, three boys, eight, seven, five, two girls, nine, four. Pets: two dogs, one cat, one cow. Owns home on farm in the country. Has held two jobs since graduation — homemaker and school teacher (one year). — FRANK T. HULSWIT, *Secretary*, Arthur D. Little Company, 35 Acorn Park, Cambridge 40, Mass.

# '53

Not much news. It looks like you people have contracted that very common disease again; you know, paralysis of the writing arm! Allow me to offer my condolences and best wishes for a speedy recovery.

A note from Milton Hollander ('53-G) and his wife. After receiving his master's degree in Mechanical Engineering at Tech, he moved on to Columbia University and completed his Ph.D. last November. In the process, he and Betty have been raising bundles of children (four) — a girl, and three boys. Milton is now a senior scientist at American Machine and Foundry, Central Research Laboratory, which is located at Stamford, Conn.; however, they are living in Teaneck, N.J. . . . A letter from the Gil Gardners (all seven of them) will bring you up to date on their life. Gil, if you recall, is at the Air Force Institute of Technology (I think that's the name; it's at Wright-Patterson) and, believe it or not, enjoys studying again. Janie reports that he is doing very well grade-wise; also adds that they saw Fred and Sandi Brecher on a recent trip to the Philadelphia area (the Brechers plus young-un are in Ardmore).

Last month I almost had a "scoop." I predicted the future marriage of Tom

Faulhaber and Nancy Reid, but to my "dissatisfaction" learned that The Technology Review editorial staff deleted my marital forecast. And, by George, you might know it; one week later, upon opening the Sunday paper I read the announcement of Tom and Nancy's engagement! (Those are the breaks!) Tom received an M.B.A. at the Harvard Business School following graduation from Tech, and is working for Ganteaume and McMullen. Nancy graduated from Mount Holyoke and received a master's degree from Harvard in education.

Betty Ann (Ferguson) Lehmann plus family has returned to the Boston area. (Her husband, Fred'51, is now assistant secretary of the Alumni Association.) Will give you a complete run-down on the past five years of her life as soon as she gets time to send me a note. . . . Joseph Miller has been appointed assistant vice-president in charge of manufacturing, at Automation Engineering Laboratory, Inc. (and of its subsidiary, AMCO, Inc.). A.E.L. designs and builds automation systems for the food, paper, textile, and packaging industries. Formerly, Joseph was assistant to the director of engineering. Congratulations! . . . At the start of the second term, John Meader will join the department of chemical engineering and chemistry at Worcester Polytechnic Institute as an assistant professor. John received both his B.S. and M.S. at Tech and is presently a candidate for his Ph.D. . . . Please send mail and money. (The former to me and the latter to the Alumni Association.) — MARTIN WOHL, *Secretary*, Room 1-131, M.I.T., Cambridge 39, Mass.

# '54

As the gentle voices of the Fort Devens cadence counters are wafted past my ears by the Marchly gusts, I sit at my typewriter and ponder the red and black ribbon, wondering what tomorrow will bring. How's that for a beginning? Well, anyway, here we are with another edition of our 1954 class notes.

Our elder statesman, Dean Jacoby, has sent us a sheaf of notes for which we are most appreciative. Dean reports that Joan Clark married Richard Moroney, Jr., last November 24, in Cambridge, where the couple is now living. . . . Alex and Joan Dreyfoos, along with young Cathy and Robbie, are living in Port Chester, N.Y. . . . Gene and Ruth Brandeis are out in Los Altos Hills, Calif., where Gene is working for Ampex and is a part-time student at the Stanford Graduate School of Business. . . . Pete Embree tried to get back to the U.S. from Peru, but only made it as far as Dallas, Texas, where, Dean claims, he is "happily located." . . . Dave and Cohnie Wones, who, like Marcia and myself, were finally caught by Uncle Sam, are making the best of the situation at Fort Belvoir until May, when they, unlike Marcia and myself, return to the blessings of civilianity. Dave will go back to work for the U. S. Geological Survey people.

John Murkland is now with the Nuclear Development Corporation of America in White Plains, N.Y. . . . Don Dix is apparently working for the Northern Research and Engineering Corporation, Cam-

bridge, Mass. (I'm quoting Dean when I say "apparently"; I wouldn't even try to guess what sinister meaning the word has here.) . . . Ray and Dot Rivero are renovating an old house in London Village, N.H. . . . Harry and Sunny Taylor are veritable balls of fire these days. Harry is "heading a small project in support of the POLARIS and MINUTEMAN missile programs" at Aerojet-General Corporation, Sacramento. In his spare time, he and two friends are setting up a "small chemical concern" which will market "a complete line of formulated epoxy resins for specialized industrial applications." At last report, Harry and friends were "selecting our initial product line, printing technical literature for our representatives, arranging temporary production facilities, and so forth." The name of the company is the Astron Chemical Company, and it is located at 2302 Watt Avenue, Sacramento, Calif. So, if you have been hurting for lack of formulated epoxy resins, good old Harry is the boy to see. Meanwhile, Harry's wife, Sunny, has been active in art circles. She is part owner of the Artists Co-operative Gallery of Sacramento, and has been exhibiting sculpture in California for the past two years. All of this in addition to taking care of daughter Alisa, and Siamese cat Name Unknown.

Dean also has sent us a few words on his own latest activities. He is now a senior consultant with Payne-Ross, Ltd., in Montreal. He apparently is enjoying life in Canada, and he and his wife Judy have extended the welcome mat to all visiting skiers, if you happen to get up that way. Dean also asks that I remind all of you people that he is still our class agent, and earnestly exhorts everyone to remember the Alumni Fund the next time the check-book is out. If there are any questions on the Fund, Dean will be glad to answer them. His address is 266 Lansdowne Avenue, Westmount 6, P. Q., Canada.

A letter from Dave Borenstein informs us that he and wife Pat now have two children, Susan and David, Jr., with a third due any minute. Dave is assistant to the development manager at the Rock Hill, S.C., plant of the Celanese Fibers Company. From Dave we also learn that Tom Molnar is working with his father's company, Fine Organics, and that Ed Hair is still with Procter and Gamble as a department manager in the production division. Like Dean, Dave would like anyone passing near Rock Hill, S.C., to drop in and visit a spell. His address is 1054 Richmond Drive.

That about does it for this month. Let us hear from any of you who can find a minute to write. Except for Harry Taylor's cat, we haven't heard much about pets lately. So at least you could drop us a card mentioning your pet's name. Maybe we could work up some statistics on class pets. Anyway, we'll be back with more gossip next month. — EDWIN G. EIGEL, JR., *Secretary*, 3654 Flora Place, St. Louis, Mo.

# '55

The Cambridge post office has been complaining for the last month and a half. Their complaint has been presented in a

formal statement composed of three points. First of all, the mail box of one Dennis Shapiro was too small; Secondly, one of their mailmen has a broken back and another one has a dislocated shoulder; and lastly, all this hit them at their busiest time of the year, i.e., Christmas. Of course, I'm not being serious but your response to the questionnaires sent out concerning our coming class reunion has been overwhelming, and it seems like the Class of '55 might break all records on promised attendance. Just to give you an idea of the enthusiasm we felt, we are going to devote the whole column to the class reunion and to bringing you people up to date on the activities of those who included class note information with their replies.

First, however, we regret to report the death of First Lieutenant Peter MacBurnie in October, 1959, due to a plane crash near Westover Air Force Base. It was quite a shock to hear of this and we know that you will be grieved at this loss.

As of the middle of January, we have received indications from classmates in 16 states that they hope to attend the reunion. We mention here some of the more distant areas to give you people from the far hinterlands a bit of incentive. Bill Friedman expects to come in from Iowa, John O'Loughlin from Kansas, Dean Zeilon from Wisconsin, Al Preys from Texas, Lyle Warnock and Bob Morgan from Michigan, Henry Theis from Illinois, Glenn Jackson from Georgia and Max Musgrove from Seattle, Wash. A complete list of people coming will be sent out by the committee in the near future.

For once we are just loaded with news. We are still compiling statistics from the questionnaire, and will have some figures for you next month. From the looks of things, we feel that our Class is probably as prosperous and as well further-educated a group of fifth yearlings as ever emerged from Rockwell Cage, diploma-in-hand.

Jim Simmons writes from New Orleans that he is attached to the office of the industrial manager, 8th Naval District. Previous to Navy duty, he finished up at Columbia University Graduate School of Business. . . . Dick Oman finished his Sc.D. at M.I.T., and is now with Grumman Aircraft on Long Island. Dick claims he is starting a harem with two daughters to grace his home in Huntington. . . . Tom Stockham says that life is a bit dreary on his U.S. Air Force duty in Albuquerque, especially as compared to Boston. He is on leave of absence from his assistant professorship in the M.I.T. Electrical Engineering Department, and among other things is taking up flying to while away the hours. . . . Dick Duggan is doing well as president of Duggan and Hiscock, Inc., engineers and contractors. He sent a newspaper clipping that told of his work on Texas Towers, the Boston Naval Shipyard, and NIKE installations.

Max Musgrove writes from Seattle telling of a son, David Martin, and of work he is doing on the application of digital computer techniques to airframe design. . . . Bob Morgan is in partnership with George Abbott '53 exploring various small businesses with a mind toward establishing their own firm. . . . Joe Saliba is with Systematics in New York City in the data processing field. He is also a partner in

## Sloan Notes

### In New York City

Twenty-seven of the New York area Sloan Fellows met with the current group of 45 for dinner at the M.I.T. Club of New York on December 16. Dr. Eli Shapiro, Professor of Finance in the School of Industrial Management, discussed with the group the work of CED's Commission on Money and Credit, of which he is deputy director of research.

William Feathers '52, current President of the Society of Sloan Fellows, welcomed the group, and was congratulated on his recent elevation to the presidency of National Carbon Company. Dean Howard W. Johnson was in New York for the meeting and extended his greetings.

The Fellows in New York City for their annual meetings with industrial and financial leaders lunched with Alfred P. Sloan, Jr., who discussed with them at length his views on problems in the current economic and industrial scene, and also met with John C. Leslie '32, Senior Vice-president of Pan American World Airways System.

### In Paris

Dean Emeritus E. P. Brooks visited recently in Paris with Louis Bodmer '57, Vice-president — La Paix, to discuss plans for the European management and technology visit of the current group of Sloan Fellows in May. Louis has volunteered to be of major assistance in making arrangements.

Datamation, Inc., in New Jersey, a computer service bureau. . . . Marv Harris writes from Atlanta, Ga., that he is married to Natalie Mintz and has daughters, Gail Robin and Marjorie Anne. A third Harris should be arriving by the time you read this — let us all pray for a boy. Marv is with Metro Products Company, manufacturer of cleaners, waxes, and other sanitary supplies.

Al Boardman writes from Los Angeles that he is sorry he can't make the reunion, but will be honeymooning at that time with the ex Miss Lina Aardewerk of Holland. Al is a project engineer at the Ramo-Wooldridge Company. . . . Bill Stierli writes from Madrid after spending a year in Denmark on a Fulbright, he is working for the U.S. Air Force on the Spanish bases program. He expects to return to Boston in the near future. . . . Doug Wixon expects to receive his M.S. at Stanford in June, and says that it's a shame that his commencement is during reunion time. He was a fighter pilot with the Air Force in Europe. After discharge Doug stayed on for a year of school in Göttingen and München, Germany, and traveled from one end of Europe to the other. He thinks that Boston is still the most desirable place to live. . . . Lloyd Gilson and wife Margie '56 are quite enthusiastic about the reunion, though Lloyd claims that Margie will probably know more of the guys than

### In India

Goff Smith '53, former President of the Society of Sloan Fellows, has just been elected a Vice-president of American Steel Foundries. Goff moves up to this position from his duties as President of the Griffin Wheel Company, a subsidiary of American Steel Foundries. He was recently in India where he enjoyed renewing his acquaintance with a Sloan classmate, *Peelamedu Ramakrishnan*, who is now a member of Parliament.

### And Elsewhere

A shift within the Campbell Soup Company sees William B. Crowley '59 going to Sacramento, Calif., as plant manager; Joe Rex '58 becoming director — plant operations, international division; and Bud Winters '57 moving to Napoleon, Ohio, as assistant plant manager.

Other recent moves include: William Mercer '56, to general manager for the state of New Hampshire, New England Telephone and Telegraph Company; R. Dewey Rinehart '56, to the Martin Company, Denver; Rueben Schlegelmilch '55, to Westinghouse Electric Corporation; James F. Bourquin '54, to St. Paul, Minn.; David L. Pitt '56, to the position of comptroller for the state of Vermont, New England Telephone and Telegraph Company; Roswell Derby '54, promoted to director of personnel and labor relations, Wm. Filene's Sons Company, Boston; John C. Davis '56, now trainmaster at Needles, Calif.; James R. Eagles '56, promoted to works manager, Bryant Electric Company (subsidiary of Westinghouse Electric Corporation); Robert H. Wilkie '53, manager of the Eastern Sales Region, AC Spark Plug, the electronics division of General Motors, in Washington, D.C. — JOHN M. WYNNE, Room 52-455, M.I.T.

he does. He is a project engineer at Monsanto Chemical Company in Springfield, Mass., and they have a son, Steven.

Bob McMath writes from Chelmsford, Mass., that he is married to Jean Randall and they have a daughter, Catherine. Bob is with Technical Operations, Inc., of Burlington. . . . Larry Berman, still at M.I.T. graduate school in Course XVI, reports another addition, Alexander. . . . Bob Buntschuh is in the Air Force at Eglin proving grounds and reports a second son, Bruce. . . . John Brown married Ann Pownall of Swarthmore, Pa., upon graduation from the Harvard Business School. He is now living in Bedford, Mass., and working for Digital Equipment Corporation as a sales engineer. . . . Lester Lee is now out of the Army and is with the nuclear division of the Martin Company as a heat transfer engineer. . . . Steve Loring has been with Economic Machinery Company in Worcester as an industrial engineer since leaving the Navy last year. . . . Burton Kahn writes from Hartford that he is married to Susan Barach and is with the Turner Construction Company. . . . Marc and Devra Gross are settled in Yonkers, N.Y. He is a patent attorney with the firm of Sweedler and Zucker in New York City.

We could go on and on with more notes, but it would not be proper to cause more post office problems by being responsible for back breaking issues of The Tech-

nology Review. We shall save a load of material for next month. Remember to reserve the weekend of June 11 and 12. See you next month. — Mrs. J. H. VENARDE, Secretary, 107 Mullin Road, Wilmington 3, Del.; L. DENNIS SHAPIRO, Assistant Secretary, 15 Linnaean Street, Cambridge 38, Mass. ELiot 4-4901.

## '56

This seems to be the month in which information comes in about classmates who have wandered off into rather strange enterprises. At least two people have gone into business for themselves in lines that are not usually associated with M.I.T. — Christmas cards and motion pictures.

Chris Booras and his brother Peter '51 found themselves without Christmas cards a few years ago. In old Yankee-Techman tradition, they decided to make their own. Showing a considerable amount of originality, they made silk screen prints on thin sheets of wood. The comments of their friends indicated that they had had a novel and appealing idea, and a little market research suggested that there might be profit in it. After a number of headaches in trying to get the process perfected, they found themselves with a rather thriving young business in Keene, N.H. So, for those who are interested in greeting cards on wood, see the Booras brothers.

Barry Brown writes that he now has a small motion picture company with a studio in New York, and is producing a series of documentary and educational films. After graduation, Barry spent two and a half years in the Army, the last two as a motion picture director at the Army picture center. This gave him the experience and motivation to go into business for himself when he was released early in 1959. He writes that there is a chance he may go to Italy to make some films in the near future. A far cry from Course XVI. Barry also reports that he is married and has a five-month-old baby girl.

Roger Borovoy has now become a member of the Massachusetts bar, after graduating from Harvard Law School last June. He is currently stationed at Fort Dix, N.J., on a six-months' tour of duty with the Army. . . . Bob Alter writes that he was released from the Army in March 1959, and is now working for a management consulting firm in Chicago. . . . Among those who have wandered far afield is James Lynn, now working for Hycom-Page in Tripoli, Libya. — BRUCE B. BREDEHOFT, Secretary, 1528 Dial Court, Springfield, Ill.; M. PHILIP BRYDEN, Assistant-Secretary, 3684 McTavish Street, Montreal 2, Quebec, Canada.

## '57

On November 1, Hank Uman and Judy Bender were married. Hank is with the Uman Construction Corporation, Freeport, L.I. . . . The marriage of Dan Hynek to Joanne O'Conner took place in White Plains, N.Y., on October 17. . . . Bernie Wexler is a manufacturing applications specialist with General Electric in Lynn. Bernie was formerly with Electric Boat Company, Groton, Conn., where he was a project design engineer on the Triton, the world's largest submarine. The Wexlers have a daughter, Joan, one year old. . . . Bob Leonard was wed to Maure Breen of Dorchester last October. . . . On September 26 Joe Alduino and Concetta Filippone were married. The Alduinos are living in New York where Joe is a chemist.

Hal Miller wrote several months ago: "I am now a first lieutenant stationed at Griffiss Air Force Base, Rome, N.Y. On a recent trip to Europe I saw Ben Inserra who is an Army lieutenant stationed in Germany. My wife Ethel and I have a new son, William Charles, born April 4, 1959. Bill and Barbara Fleischer are living in Syracuse, N.Y., and are parents of a daughter, Patricia Jeannette." . . . Dominick Fortunato is a member of the core engineering group of Allis-Chalmers nuclear power department. . . . Bill McArthur has joined Sperry Gyroscope in the marine equipment engineering department of the marine division. Bill formerly did design and systems analysis work on infrared detection seekers.

Marriage announcements which we should have reported long ago include that of Arnold Orange to Elise Churnick; Dana Dickey to Emmy Brooks; Ron Kintisch to Lenore Rosenberg; and John Funderburg to Betty Anne Blumenthal. Doug Lang was an usher at John and Betty's wedding. John is with Babcock and Wilcox, Lynchburg, Va. . . . To Sally and Jay Holladay, an entry in the stork club, Douglas Winslow, on May 17, 1959. . . . The wedding of Peter Sinz and Isabelita Araya took place in Santiago, Cuba, last June 20. . . . J. Worthen Proctor '17 reports that George Mulcahy is with United Aircraft, Windsor, Conn., and is taking advanced studies at Rensselaer Polytechnic Institute. . . . Lieutenant j/g Alex Bernhard finished submarine school and is now stationed on the West Coast. Alex was recently married and Lowell Wilson was the best man. Lowell is going back to Tech for an M.S. in Course XV, after getting out of the Army.

First death in the Class: John Upson Heckert, July 25, 1957, in a Colorado mountain climbing accident. — ALAN M. MAY, Secretary, 525 East 81st Street, New York 28, N.Y.; MARTIN R. FORSBERG, Assist-

ant Secretary, 11 Scottsfield Road, Allston 34, Mass.

## '59

Many of us have now more than completed a full semester of studying at a location other than M.I.T. I'd like comments from some of you comparing your new stamping grounds with Tech. I, for one, can now really appreciate all that M.I.T. did for its student body. Little things such as registration procedures can get out of hand at many universities.

Received a letter from Paul Schmidbauer, XV, the other day. Paul seems to be enjoying his graduate work at the University of California at Berkeley. I guess that California weather is a bit of a relief after those Boston winters. . . . On the local front, Marty Zimmerman, VI, now at Columbia Business School, was just elected vice-president of the Graduate Business Association. Congratulations, Marty.

Many members of our Class are now in some phase of military service. Bob Broder is in the Navy through the officer's candidate school program. . . . Bob Brooker is in the Marines as a pilot. . . . Dix Browder is finishing up six months at Aberdeen proving grounds. . . . Otis Bryan is now a second lieutenant in the Air Force, as is Mike Drew. . . . Scott Latimer entered the Air Force last September to begin his five-year program. . . . Tom Lewis is helping to keep the Army supplied at Fort Lee with the Quartermasters Corps. . . . H. Markham is also attending a six month Army schedule. Tom McCabe is another class member in the Navy through O.C.S. . . . Dwight Moody is in the Air Force reserves and Mike Nash has started his long awaited two-year Army indoctrination. . . . Mel Platte has also begun his Army career at Aberdeen. . . . Bill Putt is now in the Air Force. . . . Rumor has it that Larry Spiro is living high in Europe awaiting his Army tour. That's quite a demotion to take in one step! . . . Andrus Varnik, after working with General Electric, is now enjoying Army food. . . . Ed Vrablik is now almost finished with his stay at Aberdeen.

But don't let all this talk about six months or two years in the military scare anyone. In fact, you should feel relieved that the tour of duty isn't any longer. Adul Pinsuvana writes: "I'm going home to start my 10-years service with the Thai air force. And some of you guys are complaining about your military service." I think Adul has a good point there. Hope to hear from you shortly. Behave! — ROBERT A. MUH, Secretary, 8 Merrivale Road, Great Neck, N.Y.

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*Significant articles to be published in The Review this spring will include:*

**A discussion of RADIOACTIVE WASTE DISPOSAL by Rolf Eliassen '32, and  
A detailed description of the ELECTRON MICROBEAM PROBE'S usefulness  
as a means of exposing the work of forgers in the art galleries.**

Was the news of your class complete? Have you an item about a friend or yourself that wasn't reported? If so, please jot it down here, rip out the page, and mail it either to your class secretary or the editors, The Technology Review, Room 1-281, M.I.T., Cambridge, Mass.



Discussing sets and costumes are W. Markunas'60 (left), S. Carrie and B. Stone.



A. Shiner'61 (left), W. Lennon, and members of the chorus rehearse.



T. Doherty coaches N. Humphries (left) and P. Bourgue.



From left to right, C. Manning, J. Adams, and B. Pope chat with T. Doherty.

## Tech Show, 1960

A cast of about 100 players, from M.I.T., Simmons, and B.U., are putting on this year's Tech Show, "Leave It to Eve." Starring are Norma Humphries, Patty Bourgue, Judy Adams, Gus Solomons'60, and Bob Parente, G. The show is written and directed by Tom Doherty, with choreography by Gus Solomons. February 25, 26, 27, and March 4 and 5 are the dates of performance.

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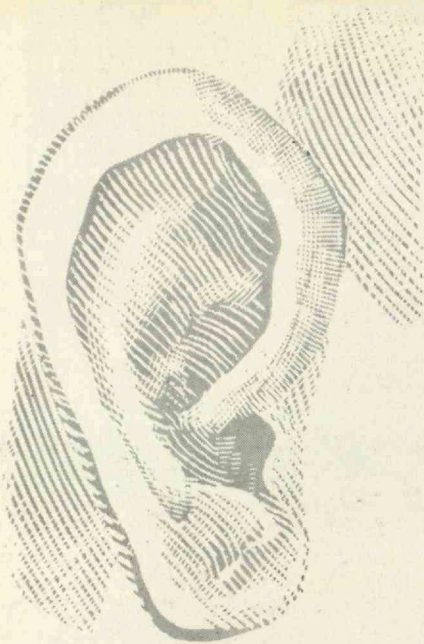
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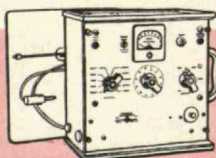
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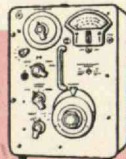
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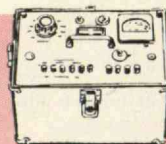
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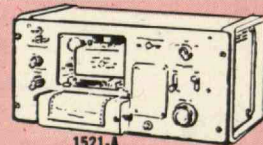
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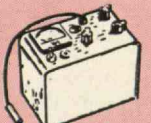
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